

PROGRAMME COMPLET LICENCE PART-66 B1.1 EASA

Module N°	Intitulé du module	Réf	Intitulé de l'item / sous-item (FR)	Niveau B1.1	Contenu détaillé (EN — texte EASA original)
MODULE 1 — MATHÉMATIQUES					
Module 1	MATHÉMATIQUES	1.1	Arithmétique	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.
Module 1	MATHÉMATIQUES	1.2(a)	Algèbre — Expressions algébriques simples	2	Evaluating simple algebraic expressions, addition, subtraction, multiplication and division, use of brackets, simple algebraic fractions.
Module 1	MATHÉMATIQUES	1.2(b)	Algèbre — Équations	1	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.
Module 1	MATHÉMATIQUES	1.3(a)	Géométrie — Constructions géométriques simples	1	Simple geometrical constructions.
Module 1	MATHÉMATIQUES	1.3(b)	Géométrie — Représentation graphique	2	Graphical representation: nature and uses of graphs, graphs of equations/functions.
Module 1	MATHÉMATIQUES	1.3(c)	Géométrie — Trigonométrie	2	Simple trigonometry: trigonometrical relationships, use of tables and rectangular and polar coordinates.

MODULE 2 — PHYSIQUE

Module 2	PHYSIQUE	2.1	Matière	2	Nature of matter: the chemical elements, structure of atoms, molecules; chemical compounds; states: solid, liquid, and gaseous; changes between states.
Module 2	PHYSIQUE	2.2.1	Mécanique — Statique	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 matter; pressure and buoyancy in liquids (barometers).
Module 2	PHYSIQUE	2.2.2	Mécanique — Cinématique	2	Linear movement: uniform motion in a straight line, motion under constant acceleration (motion under gravity); rotational movement: uniform circular motion (centrifugal/centripetal forces); periodic motion: pendular movement; simple theory of vibration, harmonics, and resonance; velocity ratio, mechanical advantage, and efficiency.
Module 2	PHYSIQUE	2.2.3(a)	Dynamique — Masse, force et énergie	2	Mass; force, inertia, work, power, energy (potential, kinetic and total energy), heat, efficiency.
Module 2	PHYSIQUE	2.2.3(b)	Dynamique — Quantité de mouvement et conservation	2	Momentum, conservation of momentum; impulse; gyroscopic principles; friction: nature and effects, coefficient of friction (rolling resistance).
Module 2	PHYSIQUE	2.2.4(a)	Dynamique des fluides — Pesanteur et masse volumique	2	Specific gravity and density.
Module 2	PHYSIQUE	2.2.4(b)	Dynamique des fluides — Viscosité, compressibilité, pressions	2	Viscosity, fluid resistance, effects of streamlining; effects of compressibility on fluids; static, dynamic, and total pressure: Bernoulli's Theorem, venturi.
Module 2	PHYSIQUE	2.3(a)	Thermodynamique — Température	2	Temperature: thermometers and temperature scales (Celsius, Fahrenheit and Kelvin); definition of heat.

Module 2	PHYSIQUE	2.3(b)	Thermodynamique — Chaleur	2	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.
Module 2	PHYSIQUE	2.4	Optique (lumière)	2	Nature of light; speed of light; laws of reflection and refraction: reflection at plane surfaces, reflection by spherical mirrors, refraction, lenses; fibre optics.
Module 2	PHYSIQUE	2.5	Propagation des ondes et acoustique	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 — FONDAMENTAUX DE L'ÉLECTRICITÉ

Module 3	FONDAMENTAUX DE L'ÉLECTRICITÉ	3.1	Théorie de l'électron	1	Structure and distribution of electrical charges within atoms, molecules, ions, and compounds; molecular structure of conductors, semiconductors, and insulators.
Module 3	FONDAMENTAUX DE L'ÉLECTRICITÉ	3.2	Électricité statique et conduction	2	Static electricity and distribution of electrostatic charges; electrostatic laws of attraction and repulsion; units of charge, Coulomb's law; conduction of electricity in solids, liquids, gases and in vacuum.
Module 3	FONDAMENTAUX DE L'ÉLECTRICITÉ	3.3	Terminologie électrique	2	The following terms, their units and factors affecting them: potential difference, electromotive force, voltage, current, resistance, conductance, charge, conventional current flow, electron flow.
Module 3	FONDAMENTAUX DE L'ÉLECTRICITÉ	3.4	Production d'électricité	1	Production of electricity by the following methods: light, heat, friction, pressure, chemical reaction, magnetism, and motion.
Module 3	FONDAMENTAUX DE L'ÉLECTRICITÉ	3.5	Sources d'électricité en courant continu	2	Construction and basic chemical reaction of primary cells, secondary cells, lead acid cells, nickel cadmium cells, lithium cells, nickel cells and other alkaline cells; cells connected in series and in parallel; internal resistance and its effect on a battery; construction, materials, and operation of thermocouples; operation of photocells.
Module 3	FONDAMENTAUX DE L'ÉLECTRICITÉ	3.6	Circuits en courant continu	2	Ohm's law, Kirchhoff's voltage, and current laws; calculations using the above laws to find resistance, voltage, and current; significance of the internal resistance of a supply.
Module 3	FONDAMENTAUX DE L'ÉLECTRICITÉ	3.7(a)	Résistance électrique	2	Specific resistance; calculation of total resistance using series, parallel and series-parallel combinations; operation and use of potentiometers and rheostats; operation of Wheatstone Bridge.

Module 3	FONDAMENTAUX DE L'ÉLECTRICITÉ	3.7(b)	Résistances (composants)	1	Positive and negative temperature coefficient conductance; resistor colour code, values and tolerances, preferred values, wattage ratings; resistors in series and in parallel; fixed resistors, stability, tolerance and limitations, methods of construction; variable resistors, thermistors, voltage-dependent resistors; construction of potentiometers and rheostats; construction of Wheatstone Bridge.
Module 3	FONDAMENTAUX DE L'ÉLECTRICITÉ	3.8	Puissance électrique	2	Power, work, and energy (kinetic and potential); dissipation of power by a resistor; power formula; calculations involving power, work, and energy.
Module 3	FONDAMENTAUX DE L'ÉLECTRICITÉ	3.9	Capacité / condensateur	2	Operation and function of a capacitor; factors that affect the 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 in parallel circuits; exponential charge and discharge of a capacitor, time constants; testing of capacitors.
Module 3	FONDAMENTAUX DE L'ÉLECTRICITÉ	3.10(a)	Magnétisme — Théorie du magnétisme	2	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; electromagnet construction and principles of operation; handclasp rules to determine magnetic field around current-carrying conductor.
Module 3	FONDAMENTAUX DE L'ÉLECTRICITÉ	3.10(b)	Magnétisme — Force magnétomotrice	2	Magnetomotive force, field strength, magnetic flux density, permeability, hysteresis loop, retentivity, coercive force reluctance, saturation point, eddy currents; precautions for care and storage of magnets.

Module 3	FONDAMENTAUX DE L'ÉLECTRICITÉ	3.11	Inductance / inducteur	2	Faraday's law; action of inducing a voltage in a conductor that moves 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 that the rates of change of primary current and mutual inductance have on induced voltage; factors that affect mutual inductance: number of turns in the coil, physical size of the coil, permeability of the 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.
Module 3	FONDAMENTAUX DE L'ÉLECTRICITÉ	3.12	Théorie des moteurs et générateurs à courant continu	2	Basic motor and generator theory; construction and purpose of components in a DC generator; operation of and factors that affect the output and direction of the current in DC generators; operation of and factors that affect the output power, torque, speed, and direction of rotation of DC motors; series-wound, shunt-wound and compound motors; starter generator construction.
Module 3	FONDAMENTAUX DE L'ÉLECTRICITÉ	3.13	Théorie du courant alternatif	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
Module 3	FONDAMENTAUX DE L'ÉLECTRICITÉ	3.14	Circuits résistifs (R), capacitifs (C) et inductifs (L)	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	FONDAMENTAUX DE L'ÉLECTRICITÉ	3.15	Transformateurs	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; line and phase voltages and currents; power in a three-phase system; primary and secondary current, voltage, turn ratio, power, efficiency; auto-transformers.

Module 3	FONDAMENTAUX DE L'ÉLECTRICITÉ	3.16	Filtres	1	Operation, application, and uses of the following filters: low pass, high pass, band pass, band stop.
Module 3	FONDAMENTAUX DE L'ÉLECTRICITÉ	3.17	Alternateurs (générateurs CA)	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, two-phase, and three-phase alternators; three-phase star and delta connection advantages, and uses; permanent magnet generators.
Module 3	FONDAMENTAUX DE L'ÉLECTRICITÉ	3.18	Moteurs à courant alternatif	2	Construction, principles of operation and characteristics of: AC synchronous and induction motors both single-phase and polyphase; methods of speed control and direction of rotation; methods of producing a rotating field: capacitor, shaded or split pole.

MODULE 4 — FONDAMENTAUX DE L'ÉLECTRONIQUE

Module 4	FONDAMENTAUX DE L'ÉLECTRONIQUE	4.1.1(a)	Semi-conducteurs — Diodes : description et caractéristiques	2	Diode symbols; diode characteristics and properties; diodes in series and in parallel; materials, electron configuration, electrical properties; P and N type materials: effects of impurities on conduction, majority and minority characters; P-N junction in a semiconductor, development of a potential across a P-N junction in unbiased, forward-biased and reverse-biased conditions; diode parameters: peak inverse voltage, maximum forward current, temperature, frequency, leakage current, power dissipation; main characteristics and use of silicon-controlled rectifiers (thyristors), light-emitting diodes (LEDs), photo-conductive diodes, rectifier diodes.
Module 4	FONDAMENTAUX DE L'ÉLECTRONIQUE	4.1.2(a)	Semi-conducteurs — Transistors : description et caractéristiques	1	Transistor symbols; component description and orientation; transistor characteristics and properties.
Module 4	FONDAMENTAUX DE L'ÉLECTRONIQUE	4.1.3(a)	Circuits intégrés — Description et fonctionnement de base	1	Description and operation of logic circuits and linear circuits/operational amplifiers.
Module 4	FONDAMENTAUX DE L'ÉLECTRONIQUE	4.2	Circuits imprimés	1	Description and use of printed circuit boards.
Module 4	FONDAMENTAUX DE L'ÉLECTRONIQUE	4.3(a)	Servomécanismes — Principes	1	Understanding of the following principles: open- and closed-loop systems, servomechanism, feedback, follow-up, null, overshoot, damping, deadband, hunting, proximity switches, analogue transducers, synchro systems and components, digital tachometers and encoders, inductance, and capacitance transmitters.

MODULE 5 — TECHNIQUES NUMÉRIQUES / SYSTÈMES D'INSTRUMENTS ÉLECTRONIQUES

Module 5	TECHNIQUES NUMÉRIQUES / SYSTÈMES D'INSTRUMENTS ÉLECTRONIQUES	5.1	Systèmes d'instruments électroniques	1	Typical arrangements of systems and cockpit layout of electronic instrument systems.
Module 5	TECHNIQUES NUMÉRIQUES / SYSTÈMES D'INSTRUMENTS ÉLECTRONIQUES	5.2	Systèmes de numération	1	Numbering systems: binary, octal, and hexadecimal; demonstration of conversions between the decimal and binary systems, octal and hexadecimal systems and vice versa.
Module 5	TECHNIQUES NUMÉRIQUES / SYSTÈMES D'INSTRUMENTS ÉLECTRONIQUES	5.3	Conversion de données	1	Analogue data, digital data; operation and application of analogue-to-digital and digital-to-analogue converters, inputs and outputs, limitations of various types.
Module 5	TECHNIQUES NUMÉRIQUES / SYSTÈMES D'INSTRUMENTS ÉLECTRONIQUES	5.4	Bus de données	2	Operation of data buses in aircraft systems, including knowledge of ARINC and other specifications. Aircraft network/Ethernet.
Module 5	TECHNIQUES NUMÉRIQUES / SYSTÈMES D'INSTRUMENTS ÉLECTRONIQUES	5.5(a)	Circuits logiques — Identification et applications	2	Identification of common logic gate symbols, tables and equivalent circuits; applications used for aircraft systems, schematic diagrams.
Module 5	TECHNIQUES NUMÉRIQUES / SYSTÈMES D'INSTRUMENTS ÉLECTRONIQUES	5.6(a)	Architecture informatique — Terminologie et technologie	2	Computer terminology (including bit, byte, software, hardware, CPU, IC, and various memory devices such as RAM, ROM, PROM); computer technology (as applied in aircraft systems).
Module 5	TECHNIQUES NUMÉRIQUES / SYSTÈMES D'INSTRUMENTS ÉLECTRONIQUES	5.10	Fibres optiques	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.
Module 5	TECHNIQUES NUMÉRIQUES / SYSTÈMES D'INSTRUMENTS ÉLECTRONIQUES	5.11	Afficheurs électroniques	2	Principles of operation of common types of displays used in modern aircraft, including cathode-ray tubes (CRTs), light-emitting diodes (LEDs) and liquid crystal displays (LCDs).
Module 5	TECHNIQUES NUMÉRIQUES / SYSTÈMES D'INSTRUMENTS ÉLECTRONIQUES	5.12	Dispositifs sensibles aux décharges électrostatiques	2	Special handling of components sensitive to electrostatic discharges; awareness of risks and possible damage, component, and personnel antistatic protection devices.
Module 5	TECHNIQUES NUMÉRIQUES / SYSTÈMES D'INSTRUMENTS ÉLECTRONIQUES	5.13	Gestion et contrôle des logiciels	2	Awareness of restrictions, airworthiness requirements and possible catastrophic effects of unapproved changes to software programs.

Module 5	TECHNIQUES NUMÉRIQUES / SYSTÈMES D'INSTRUMENTS ÉLECTRONIQUES	5.14	Environnement électromagnétique	2	Influence of the following phenomena on maintenance practices for electronic systems: EMC — Electromagnetic Compatibility; EMI — Electromagnetic Interference; HIRF — High-Intensity Radiated Field; lightning / lightning protection.
Module 5	TECHNIQUES NUMÉRIQUES / SYSTÈMES D'INSTRUMENTS ÉLECTRONIQUES	5.15	Systèmes aéronefs électroniques/numériques typiques	1	General arrangement of typical electronic/digital aircraft systems and associated BITE (Built-In Test Equipment), such as: ACARS, FBW — Fly-by-Wire, FMS — flight management system, IRS — inertial reference system; ECAM, EICAS, EFIS, GNSS, TCAS, Integrated Modular Avionics, Cabin Systems, Information Systems.

MODULE 6 — MATÉRIAUX ET QUINCAILLERIE

Module 6	MATÉRIAUX ET QUINCAILLERIE	6.1(a)	Matériaux ferreux — Aciers alliés utilisés en aéronautique	2	Characteristics, properties and identification of common alloy steels used in aircraft; heat treatment and application of alloy steels.
Module 6	MATÉRIAUX ET QUINCAILLERIE	6.1(b)	Matériaux ferreux — Essais mécaniques	1	Testing of ferrous materials for hardness, tensile strength, fatigue strength and impact resistance.
Module 6	MATÉRIAUX ET QUINCAILLERIE	6.1(c)	Matériaux ferreux — Procédures de réparation et d'inspection	2	Repair and inspection procedures for ferrous materials, structures, and airframes.
Module 6	MATÉRIAUX ET QUINCAILLERIE	6.2(a)	Matériaux non ferreux — Caractéristiques	2	Characteristics, properties and identification of common non-ferrous materials used in aircraft; heat treatment and application of non-ferrous materials.
Module 6	MATÉRIAUX ET QUINCAILLERIE	6.2(b)	Matériaux non ferreux — Essais mécaniques	1	Testing of non-ferrous material for hardness, tensile strength, fatigue strength and impact resistance.
Module 6	MATÉRIAUX ET QUINCAILLERIE	6.2(c)	Matériaux non ferreux — Procédures de réparation et d'inspection	2	Repair and inspection procedures for non-ferrous materials, structures, and airframes.
Module 6	MATÉRIAUX ET QUINCAILLERIE	6.3.1(a)	Matériaux composites et non métalliques — Caractéristiques	2	Characteristics, properties and identification of common composite and non-metallic materials, other than wood, used in aircraft; sealant and bonding agents.
Module 6	MATÉRIAUX ET QUINCAILLERIE	6.3.1(b)	Matériaux composites et non métalliques — Détection des défauts	2	Detection of defects/deterioration in composite and non-metallic materials.
Module 6	MATÉRIAUX ET QUINCAILLERIE	6.3.1(c)	Matériaux composites et non métalliques — Réparation et inspection	2	Repair of and inspection procedures for composite and non-metallic materials, structures, and airframes.
Module 6	MATÉRIAUX ET QUINCAILLERIE	6.3.2	Structures en bois	1	Construction methods of wooden airframe structures; characteristics, properties and types of wood and glue used in aeroplanes; preservation and maintenance of wooden structures; types of defects in wood material and wooden structures; detection of defects in wooden structures; repair of wooden structures.

Module 6	MATÉRIAUX ET QUINCAILLERIE	6.3.3	Revêtement en tissu	1	Characteristics, properties and types of fabrics used in aeroplanes; inspection methods for fabrics; types of defects in fabrics; repair of fabric covering.
Module 6	MATÉRIAUX ET QUINCAILLERIE	6.4(a)	Corrosion — Fondamentaux chimiques	1	Chemical fundamentals; formation by galvanic action process, microbiological contamination, mechanical stress.
Module 6	MATÉRIAUX ET QUINCAILLERIE	6.4(b)	Corrosion — Types de corrosion	3	Types of corrosion and their identification; causes of corrosion; material types, and their susceptibility to corrosion.
Module 6	MATÉRIAUX ET QUINCAILLERIE	6.5.1	Fixations — Filetages	2	Screw nomenclature; thread forms, dimensions and tolerances for standard threads used in aircraft; measuring screw threads.
Module 6	MATÉRIAUX ET QUINCAILLERIE	6.5.2	Fixations — Boulons, goujons et vis	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.
Module 6	MATÉRIAUX ET QUINCAILLERIE	6.5.3	Fixations — Dispositifs de freinage	2	Tab and spring washers, locking plates, split pins, pal-nuts, wire locking, quick-release fasteners, keys, circlips, cotter pins.
Module 6	MATÉRIAUX ET QUINCAILLERIE	6.5.4	Fixations — Rivets aéronautiques	2	Types of solid and blind rivets: specifications and identification, heat treatment.
Module 6	MATÉRIAUX ET QUINCAILLERIE	6.6(a)	Tuyauteries et raccords — Identification	2	Identification and types of rigid and flexible pipes and their connectors used in aircraft.
Module 6	MATÉRIAUX ET QUINCAILLERIE	6.6(b)	Tuyauteries et raccords — Raccords normalisés	2	Standard unions for aircraft hydraulic, fuel, oil, pneumatic and air system pipes.
Module 6	MATÉRIAUX ET QUINCAILLERIE	6.7	Ressorts	2	Types of springs, materials, characteristics, and applications.
Module 6	MATÉRIAUX ET QUINCAILLERIE	6.8	Roulements	2	Purpose of bearings, loads, material, construction; types of bearings and their application.

Module 6	MATÉRIAUX ET QUINCAILLERIE	6.9	Transmissions mécaniques	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.
Module 6	MATÉRIAUX ET QUINCAILLERIE	6.10	Câbles de commande	2	Types of cables; end fittings, turnbuckles and compensation devices; pulleys and cable system components; Bowden cables; aircraft flexible control systems.
Module 6	MATÉRIAUX ET QUINCAILLERIE	6.11	Câbles électriques et connecteurs	2	Cable types, construction and characteristics; high-tension and coaxial cables; crimping; connector types, pins, plugs, sockets, insulators, current and voltage rating, coupling, identification codes.

MODULE 7 — PRATIQUES DE MAINTENANCE

Module 7	PRATIQUES DE MAINTENANCE	7.1	Précautions de sécurité — Aéronef et atelier	3	Aspects of safe working practices including precautions to be taken when working with electricity, gases (especially oxygen), oils, and chemicals. Fuel tank safety and fuel tank entry procedures and precautions. Awareness and precautions regarding aircraft equipped with ballistic recovery systems. Instructions for the remedial action to be taken in the event of a fire or another accident, including information on fire-extinguishing agents.
Module 7	PRATIQUES DE MAINTENANCE	7.2	Pratiques d'atelier	3	Care of tools, control of tools, use of workshop materials; dimensions, allowances and tolerances, workmanship standards; calibration of tools and equipment, calibration standards.
Module 7	PRATIQUES DE MAINTENANCE	7.3	Outillage	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.
Module 7	PRATIQUES DE MAINTENANCE	7.4	Potential safety hazards when working with electrical systems and protective equipment	3	Electric shock hazards and effects of current on the human body Arc flash, arc blast, and stored energy hazards (capacitors, batteries, power electronics) Battery-related hazards: chemical, thermal runaway, fire and explosion risks Electrostatic discharge (ESD) and electromagnetic hazards
Module 7	PRATIQUES DE MAINTENANCE	7.5	Dessins techniques, schémas et normes	2	Drawing types and diagrams, their symbols, dimensions, tolerances and projections; identification of title block information; microfilm, microfiche, and computerised presentations;
Module 7	PRATIQUES DE MAINTENANCE	7.6	Ajustements et jeux fonctionnels	2	Drill sizes for bolt holes, classes of fits; common system for 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.

Module 7	PRATIQUES DE MAINTENANCE	7.7	Système d'interconnexion du câblage électrique (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; coaxial 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; High-Intensity Radiated Fields (HIRF) and protection principles; soldering of electrical wires, EWIS installations, inspection, repair, maintenance, and cleanliness standards.
Module 7	PRATIQUES DE MAINTENANCE	7.8	Rivetage	2	Riveted joints, rivet spacing and pitch; tools used for riveting and dimpling; inspection of riveted joints.
Module 7	PRATIQUES DE MAINTENANCE	7.9	Tuyaux et flexibles	2	Bending and belling/flaring aircraft pipes; inspection and testing of aircraft pipes and hoses; installation and clamping of pipes.
Module 7	PRATIQUES DE MAINTENANCE	7.10	Ressorts	2	Inspection and testing of springs.
Module 7	PRATIQUES DE MAINTENANCE	7.11	Roulements	2	Testing, cleaning and inspection of bearings; lubrication requirements for bearings; defects in bearings and their causes.
Module 7	PRATIQUES DE MAINTENANCE	7.12	Transmissions mécaniques	2	Inspection of gears, backlash; inspection of belts and pulleys, chains and sprockets; inspection of screw jacks, lever devices, push-pull rod systems.
Module 7	PRATIQUES DE MAINTENANCE	7.13	Câbles de commande	2	Swaging of end fittings; inspection and testing of control cables; Bowden cables; aircraft flexible control systems.
Module 7	PRATIQUES DE MAINTENANCE	7.14.1	Travail de la tôle	2	Marking out and calculation of bend allowance; sheet metal working, including bending and forming; inspection of sheet metal work.
Module 7	PRATIQUES DE MAINTENANCE	7.14.2	Matériaux composites et non métalliques	2	Bonding practices; environmental conditions; inspection methods.

Module 7	PRATIQUES DE MAINTENANCE	7.14.3	Fabrication additive	1	Common additive manufacturing techniques and their influence on the mechanical properties of the finished part; inspection of additive manufactured parts and common production failures.
Module 7	PRATIQUES DE MAINTENANCE	7.16(a)	Masse et centrage — Calcul du centre de gravité	2	Calculation of centre-of-gravity / balance limits: use of relevant documents.
Module 7	PRATIQUES DE MAINTENANCE	7.16(b)	Masse et centrage — Pesée de l'aéronef	2	Preparation of aircraft for weighing; aircraft weighing.
Module 7	PRATIQUES DE MAINTENANCE	7.17	Manutention et stockage des aéronefs	2	Aircraft taxiing/towing and associated safety precautions; aircraft jacking, chocking, securing and associated safety precautions; aircraft storage methods; refuelling/defuelling procedures; de-icing/anti-icing procedures; electrical, hydraulic, and pneumatic ground supplies; effects of environmental conditions on aircraft handling and operation.
Module 7	PRATIQUES DE MAINTENANCE	7.18(a)	Inspection — Types de défauts et inspection visuelle	3	Types of defects and visual inspection techniques; corrosion removal, assessment and reprotection.
Module 7	PRATIQUES DE MAINTENANCE	7.18(b)	Méthodes générales de réparation — Manuel de réparation structurale (SRM)	2	General repair methods, structural repair manual; ageing, fatigue, and corrosion control programmes.
Module 7	PRATIQUES DE MAINTENANCE	7.18(c)	Contrôles non destructifs (CND)	2	Non-destructive inspection techniques including penetrant, radiographic, eddy current, magnetic particle, ultrasonic and borescope inspections; including practical training in colour contrast penetrant inspection.
Module 7	PRATIQUES DE MAINTENANCE	7.18(d)	Techniques de démontage et de remontage	2	Disassembly and reassembly techniques.
Module 7	PRATIQUES DE MAINTENANCE	7.18(e)	Techniques de dépannage (troubleshooting)	2	Troubleshooting techniques.

Module 7	PRATIQUES DE MAINTENANCE	7.19(a)	Événements anormaux — Inspections après impact foudre et pénétration HIRF	2	Inspections following lightning strikes and HIRF penetration.
Module 7	PRATIQUES DE MAINTENANCE	7.19(b)	Événements anormaux — Inspections après atterrissage dur et turbulences	2	Inspections following abnormal events such as heavy landings and flight through turbulence.
Module 7	PRATIQUES DE MAINTENANCE	7.20	Procédures de maintenance	2	Maintenance planning; modification procedures; stores procedures; certification/release procedures; interface with aircraft operation; maintenance inspection / quality control / quality assurance; additional maintenance procedures; control of life-limited components.
Module 7	PRATIQUES DE MAINTENANCE	7.21	Documentation et communication	2	Documentation: elements and criteria for writing work reports, troubleshooting reports, and shift handover instructions. Communication: clear, comprehensive, and concise.

MODULE 8 — AÉRODYNAMIQUE DE BASE

Module 8	AÉRODYNAMIQUE DE BASE	8.1	Physique de l'atmosphère — Atmosphère standard internationale (ISA)	2	International Standard Atmosphere (ISA), and its application to aerodynamics.
Module 8	AÉRODYNAMIQUE DE BASE	8.2	Aérodynamique	2	Airflow around a body; boundary layer, laminar and turbulent flow, free stream flow, relative airflow, upwash 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 wash-out, 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, and frost.
Module 8	AÉRODYNAMIQUE DE BASE	8.3	Théorie du vol	2	Relationship between lift, weight, thrust and drag; glide ratio; steady-state flights, performance; theory of the turn; influence of load factor: stall, flight envelope, and structural limitations; lift augmentation.
Module 8	AÉRODYNAMIQUE DE BASE	8.4	Écoulement à grande vitesse	2	Speed of sound, subsonic flight, transonic flight, supersonic flight, Mach number, critical Mach number, compressibility buffet, shock wave, aerodynamic heating, area rule; factors that affect airflow in engine intakes of high-speed aircraft; effects of sweepback on critical Mach number.
Module 8	AÉRODYNAMIQUE DE BASE	8.5	Stabilité et dynamique du vol	2	Longitudinal, lateral, and directional stability (active and passive).

MODULE 9 — FACTEURS HUMAINS

Module 9	FACTEURS HUMAINS	9.1	Généralités	2	The need to take human factors into account when performing maintenance; incidents attributable to human factors/human error; Murphy's law.
Module 9	FACTEURS HUMAINS	9.2	Performances et limitations humaines	2	Vision; hearing; information processing; attention and perception; memory; claustrophobia and physical access.
Module 9	FACTEURS HUMAINS	9.3	Psychologie sociale	1	Accountability and responsibility: individual and group; motivation and demotivation; peer pressure; cultural issues; teamwork; management, supervision, and leadership.
Module 9	FACTEURS HUMAINS	9.4	Facteurs influençant les performances	2	Fitness/health; stress: domestic and work related; time pressure and deadlines; workload: overload, underload, and workload management; sleep and fatigue, shift work; alcohol, medication, drug abuse; lack of manpower.
Module 9	FACTEURS HUMAINS	9.5	Environnement physique	1	Noise and fumes; illumination; climate and temperature; motion and vibration; working environment; situational awareness.
Module 9	FACTEURS HUMAINS	9.6	Tâches	1	Physical work; repetitive tasks, complacency; visual inspection; complex systems; critical maintenance tasks and error-capturing methods; technical documentation: access, use, and quality.
Module 9	FACTEURS HUMAINS	9.7	Communication	2	Within and between teams; work logging and recording; shift handover; keeping up to date, currency; dissemination of information.
Module 9	FACTEURS HUMAINS	9.8	Erreur humaine	2	Error models and theories; types of error in maintenance tasks; implications of errors (e.g. accidents); organisational errors; avoiding and managing errors.

Module 9	FACTEURS HUMAINS	9.9	Gestion de la sécurité	2	Risk management; occurrence reporting; safety culture; just culture; identifying, avoiding, and reporting hazards; organisational human-factors programme: professionalism and integrity, error-provoking behaviour, reporting errors, disciplinary policy, error investigation, action to address problems, feedback, assertiveness; dealing with emergencies.
Module 9	FACTEURS HUMAINS	9.10	La 'Sale Douzaine' (Dirty Dozen) et atténuation des risques	2	The 'Dirty Dozen': the twelve most common human-factors errors in maintenance: lack of communication, lack of teamwork, lack of assertiveness, complacency, fatigue, stress, lack of knowledge, lack of resources, lack of awareness, distraction, pressure, norms. Risk-mitigation methods.

MODULE 10 — LÉGISLATION AÉRONAUTIQUE

Module 10	LÉGISLATION AÉRONAUTIQUE	10.1	Cadre réglementaire	1	Role of: the International Civil Aviation Organization (ICAO); the European Commission (EC); the European Union Aviation Safety Agency (EASA); the European Union Member States and national aviation authorities; the bilateral agreements concluded by the European Commission; Regulation (EU) 2018/1139 (the Basic Regulation) and its implementing acts: Regulations (EU) No 748/2012 (Initial Airworthiness) and (EU) No 1321/2014 (Continuing Airworthiness); the relationship between regulations (hard law) and AMC, GM and CSs (soft law); occurrence reporting according to Regulation (EU) No 376/2014; the relationship between the various annexes (parts) relating to Initial and Continuing Airworthiness (such as Part 21, Part-M, Part-145, Part-66, Part-147, Part-T, Part-ML, Part-CAMO, and Part-CAO) and Regulations (EU) No 965/2012 (Air Operations) and (EU) No 1178/2011 (Air Crew Regulation).
Module 10	LÉGISLATION AÉRONAUTIQUE	10.2	Personnel de certification — Maintenance	2	Deep understanding of Part-66 maintenance licences with the associated privileges and authorisations, and how to exercise them properly for the different aircraft
Module 10	LÉGISLATION AÉRONAUTIQUE	10.3	Organismes d'entretien agréés (OEA / Part-145, Part-CAO)	2	General understanding of Part-145 and Part-CAO.

Module 10	LÉGISLATION AÉRONAUTIQUE	10.5	Opérations aériennes	1	General understanding of Regulation (EU) No 965/2012 (the Air Operations Regulation); differences between commercial and non-commercial air operations, and their influence on aircraft maintenance; Air Operator Certificates (AOCs) and self-declaration authorisations; air operator responsibilities regarding continuing airworthiness and maintenance; specialised operations / specific approvals: ETOPS, CAT I/II/III, and BRNAV; Minimum Equipment List (MEL) and Configuration Deviation List (CDL); aircraft placarding and markings; documents to be carried on board: Certificate of Airworthiness, Airworthiness Review Certificate, Permit to Fly, Certificate of Registration, Noise Certificate, Weight and Balance report, Radio Station Licence.
Module 10	LÉGISLATION AÉRONAUTIQUE	10.6	Certification des aéronefs, pièces et équipements	2	Basic understanding of Part 21 and of the following EASA certification specifications: CS-22, CS-23, CS-25, CS-27, CS-29, and CS-STAN.
Module 10	LÉGISLATION AÉRONAUTIQUE	10.7	Maintien de la navigabilité	2	General understanding of the Part 21 requirements on continuing airworthiness; general understanding of Part-M, Part-ML and Part-CAMO; Aircraft Maintenance Programme.
Module 10	LÉGISLATION AÉRONAUTIQUE	10.8	Principes de surveillance du maintien de la navigabilité	1	Oversight principles in continuing airworthiness.
Module 10	LÉGISLATION AÉRONAUTIQUE	10.9	Maintenance et certification hors réglementation européenne en vigueur	1	Maintenance of European Union aircraft that are not within the scope of Regulation (EU) 2018/1139 (Annex I aircraft); European military airworthiness requirement (EMAR) 66 licence; applicable national and international requirements for component maintenance, welding, painting, NDT, etc. (if not superseded by EU requirements).
Module 10	LÉGISLATION AÉRONAUTIQUE	10.10	Cybersécurité en maintenance aéronautique	1	Regulation on the introduction of organisation requirements for the management of information security risks related to aeronautical information systems used in civil aviation.

MODULE 11 — AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS

Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.1(a)	Théorie du vol — Aérodynamique de l'avion et commandes de vol	2	Operation and effect of: roll control: ailerons and spoilers; pitch control: elevators, stabilators, variable incidence stabilisers and canards; yaw control, rudder limiters; elevons, ruddervators; high-lift devices: slots, slats, flaps, flaperons; drag-inducing devices: spoilers, lift dumpers, speed brakes; trim tabs, servo tabs, control surface bias.
Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.1(b)	Théorie du vol — Autres dispositifs aérodynamiques de l'avion	2	Operation and effect of: balance and antibalance (leading) tabs; spring tabs, mass balance, aerodynamic balance panels; effects of wing fences, saw tooth leading edges; boundary layer control using vortex generators, stall wedges or leading-edge devices.
Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.2(a)	Structures de cellule (ATA 51) — Concepts généraux	2	Zonal and station identification systems; electrical bonding; lightning strike protection provisions.
Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.2(b)	Structures de cellule (ATA 51) — Exigences de résistance structurale	2	Structural classification: primary, secondary, and tertiary; fail-safe, safe-life, damage-tolerance concepts; stress, strain, bending, compression, shear, torsion, tension, hoop stress, fatigue; drains and ventilation provisions; system installation provisions.
Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.2(c)	Structures de cellule (ATA 51) — Méthodes de construction	2	Stressed skin fuselage, formers, stringers, longerons, bulkheads, frames, doublers, struts, ties, beams, floor structures, reinforcement, skinning, anticorrosive protection, wing, empennage and engine attachments; structure assembly techniques: riveting, bolting, bonding; methods of surface protection: chromating, anodising, painting; surface cleaning; airframe symmetry: methods of alignment and symmetry checks.

Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.3.1(a)	Fuselage, portes, hublots (ATA 52/53/56) — Principes de construction	2	Construction and pressurisation sealing; wing, stabiliser, pylon, and undercarriage attachments; seat installation and cargo loading system; doors and emergency exits: construction, mechanisms, operation and safety devices; windows and windscreen construction and mechanisms.
Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.3.1(b)	Fuselage — Dispositifs de remorquage aérien	1	Airborne towing devices (glider, banner, target).
Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.3.1(c)	Portes et sorties de secours	2	Doors and emergency exits: safety devices; cargo loading system.
Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.3.2	Voilure (ATA 57)	2	Construction; fuel storage; landing gear, pylon, control surface and high lift/drag attachments.
Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.3.3	Empennages (ATA 55)	2	Construction; control surface attachment.
Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.3.4	Surfaces de commande de vol (ATA 55/57)	2	Construction and attachments; balancing — mass and aerodynamics.
Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.3.5	Nacelles et pylônes (ATA 54)	2	Nacelles/pylons: construction, firewalls, engine mounts.
Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.4(a)	Conditionnement d'air et pressurisation (ATA 21) — Pressurisation	3	Pressurisation systems; cabin pressure controllers, control, and safety valves; control and indication.
Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.4(b)	Conditionnement d'air et pressurisation (ATA 21) — Alimentation en air	3	Sources of air supply including engine bleed, APU and ground cart; distribution systems.
Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.4(c)	Conditionnement d'air et pressurisation (ATA 21) — Climatisation	3	Air-conditioning systems; air cycle and vapour cycle machines; flow, temperature and humidity control system; control and indication control valves.

Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.4(d)	Conditionnement d'air et pressurisation (ATA 21) — Sécurité et alarmes	3	Protection and warning devices.
Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.5.1	Instruments (ATA 31)	2	Pitot-static: airspeed indicators, vertical speed indicators, altimeters; gyroscopic: gyroscopic principles, artificial horizons, attitude directors, direction indicators, horizontal situation indicators (HSI), slip indicators, turn indicators, turn coordinators; compass systems: direct reading, remote reading; stall-warning systems and angle-of-attack indicating systems; glass cockpit; indications of other aircraft systems.
Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.5.2	Systèmes avioniques	1	Fundamentals of system layouts and operation of: autoflight (ATA 22); communication systems (ATA 23): VHF, HF, SATCOM, CPDLC, audio systems, ELTs, CVR; navigation systems (ATA 34): VOR, ADF, ILS, MLS, FDS/DME, RNAV, FMS, satellite navigation, ATC transponder/SSR, TCAS, weather avoidance radar, radio altimeter, INS, ARINC communication and reporting. Types and uses of avionics general test equipment.
Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.6	Alimentation électrique (ATA 24)	3	Installation and operation of batteries; DC power generation; AC power generation; emergency power generation; voltage regulation; power distribution; inverters, transformers,
Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.7(a)	Équipements et aménagements (ATA 25) — Équipements de secours	2	Emergency equipment requirements.
Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.7(b)	Équipements et aménagements (ATA 25) — Aménagement cabine et soutes	1	Seats, harnesses, and belts; cabin layout; equipment layout; cabin furnishing installation; galley installation; cargo handling and retention equipment; airstairs.
Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.8(a)	Protection incendie (ATA 26) — Détection fumée/feu et extinction	1	Fire and smoke detection and warning systems; fire-extinguishing systems; system tests.
Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.8(b)	Protection incendie (ATA 26) — Extincteurs portatifs	1	Portable fire extinguisher.

Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.9(a)	Commandes de vol (ATA 27) — Commandes primaires et secondaires	3	Primary controls: aileron, elevator, rudder, spoiler; trim control, trim tabs; high-lift devices; system operation: manual; gust locks and gust lock systems; artificial feel, yaw damper, Mach trim, rudder limiter; stall-warning systems.
Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.9(b)	Commandes de vol (ATA 27) — Actionnement et protection	3	Active load control; lift dump, speed brakes; hydraulic, pneumatic systems; stall-protection systems.
Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.9(c)	Commandes de vol (ATA 27) — Fonctionnement du système	3	Electrical systems, fly-by-wire systems.
Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.9(d)	Commandes de vol (ATA 27) — Équilibrage et réglage (balancing and rigging)	3	Balancing and rigging.
Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.10(a)	Systèmes carburant (ATA 28/47) — Architecture du système	3	System layout; fuel tanks; supply systems.
Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.10(b)	Systèmes carburant (ATA 28/47) — Gestion du carburant	3	Cross-feed and transfer; refuelling and defuelling.
Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.10(c)	Systèmes carburant (ATA 28/47) — Indications et alarmes	3	Indication and warnings.
Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.10(d)	Systèmes carburant (ATA 28/47) — Systèmes spéciaux	3	Dumping, venting, and draining; inert gas systems.
Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.10(e)	Systèmes carburant (ATA 28/47) — Équilibrage longitudinal en carburant	3	Longitudinal balance fuel systems.
Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.11(a)	Système hydraulique (ATA 29) — Description du système	3	System layout; hydraulic fluids; hydraulic reservoirs and accumulators; filters; power distribution.
Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.11(b)	Système hydraulique (ATA 29) — Fonctionnement (1)	3	Pressure generation: electric and mechanical; pressure control; indication and warning systems; servicing.

Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.11(c)	Système hydraulique (ATA 29) — Fonctionnement (2)	3	Pressure generation: pneumatic; emergency pressure generation; interface with other systems.
Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.12(a)	Protection givrage et pluie (ATA 30) — Principes	3	Ice formation, classification, and detection.
Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.12(b)	Protection givrage et pluie (ATA 30) — Dégivrage	3	De-icing systems: electrical, hot-air, pneumatic, chemical; probe and drain heating.
Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.12(c)	Protection givrage et pluie (ATA 30) — Antigivrage	3	Anti-icing systems: electrical, hot-air, chemical.
Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.12(d)	Protection givrage et pluie (ATA 30) — Essuie-glaces	3	Wiper systems.
Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.12(e)	Protection givrage et pluie (ATA 30) — Répulsif de pluie	3	Rain-repellent systems.
Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.13(a)	Train d'atterrissage (ATA 32) — Description	3	Construction, shock absorbing; tyres.
Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.13(b)	Train d'atterrissage (ATA 32) — Fonctionnement du système	3	Extension and retraction systems: normal and emergency; indications and warnings; wheels, brakes, antiskid, and autobraking; steering.
Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.13(c)	Train d'atterrissage (ATA 32) — Détection sol/air (air-ground sensing)	3	Air-ground sensing.
Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.13(d)	Train d'atterrissage (ATA 32) — Protection de l'empennage arrière	3	Tail protection: skids.
Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.14	Éclairage (ATA 33)	3	External: navigation, anticollision, landing, taxiing, ice; internal: cabin, cockpit, cargo; emergency.
Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.15	Oxygène (ATA 35)	3	System layout: cockpit, cabin; sources, storage, charging and distribution; supply regulation; indications and warnings.

Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.16(a)	Pneumatique / dépression (ATA 36) — Systèmes	3	System layout; sources: engine/APU, compressors, reservoirs, ground supply; pressure control; distribution; indications and warnings; interface with other systems.
Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.16(b)	Pneumatique / dépression (ATA 36) — Pompes	3	Pressure and vacuum pumps.
Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.17(a)	Eau et déchets (ATA 38) — Systèmes	3	Water system layout, supply, distribution, servicing and draining; toilet system layout, flushing and servicing.
Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.17(b)	Eau et déchets (ATA 38) — Corrosion	3	Corrosion aspects.
Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.18	Systèmes de maintenance embarqués — CMC (ATA 45)	2	Central maintenance computers; data-loading system; electronic library system; printing systems; structure monitoring (damage-tolerance monitoring).
Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.19(a)	Avionique modulaire intégrée — AMI (ATA 42) — Description et théorie	2	Overall system description and theory: core system; network components. Functions typically integrated in IMA modules: 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.
Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.19(b)	Avionique modulaire intégrée — AMI (ATA 42) — Architectures types	2	Typical system layouts.

Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.20	Systèmes cabine (ATA 44)	2	System architecture, operation, and control of systems for: passenger in-flight entertainment; communication within the aircraft (CIDS); communication between the aircraft cabin and ground stations including voice, data, music, and video transmission. CIDS interface between cockpit/cabin crew and cabin systems. Data exchange between LRUs. Flight attendant panels (FAPs). CNS server interfaces with: data/radio communication, CCS, IFES, ECS, CMMS, CMS, MCSs.
Module 11	AÉRODYNAMIQUE, STRUCTURES ET SYSTÈMES AVIONS	11.21	Systèmes d'information (ATA 46)	2	System architecture, operation, and control of: storage and electronic library; updating; retrieving of digital information; ATIMS and network server systems; aircraft general

MODULE 15 — MOTEUR À TURBINE À GAZ

Module 15	MOTEUR À TURBINE À GAZ	15.1	Principes fondamentaux	2	Potential energy, kinetic energy, Newton's laws of motion, Brayton cycle; the relationship between force, work, power, energy, velocity, and acceleration; constructional arrangement and operation of turbojet, turbofan, turboshaft, turboprop, and geared turbofan engines.
Module 15	MOTEUR À TURBINE À GAZ	15.2	Performances moteur	2	Gross thrust, net thrust, choked nozzle thrust, thrust distribution, resultant thrust, thrust horsepower, equivalent shaft horsepower, specific fuel consumption; engine efficiencies; by-pass ratio and engine pressure ratio; pressure, temperature, and velocity of the gas flow; engine ratings, static thrust, influence of speed, altitude and hot climate, flat rating, limitations.
Module 15	MOTEUR À TURBINE À GAZ	15.3	Entrée d'air (inlet)	2	Compressor inlet ducts; effects of various inlet configurations; ice protection.
Module 15	MOTEUR À TURBINE À GAZ	15.4	Compresseurs	2	Axial and centrifugal types; constructional features, operating principles, and applications; fan balancing; operation: causes and effects of compressor stall and surge; methods of air-flow control: bleed valves, variable inlet guide vanes, variable stator vanes, rotating stator blades; compressor ratio.
Module 15	MOTEUR À TURBINE À GAZ	15.5	Chambre de combustion	2	Constructional features and principles of operation.
Module 15	MOTEUR À TURBINE À GAZ	15.6	Section turbine	2	Operation and characteristics of different turbine blade types; blade-to-disk attachment; nozzle guide vanes; causes and effects of turbine blade stress and creep.
Module 15	MOTEUR À TURBINE À GAZ	15.7	Tuyère d'échappement	2	Constructional features and principles of operation; convergent, divergent, and variable area nozzles; engine noise reduction; thrust reversers.

Module 15	MOTEUR À TURBINE À GAZ	15.8	Roulements et joints d'étanchéité	2	Constructional features and principles of operation.
Module 15	MOTEUR À TURBINE À GAZ	15.9	Lubrifiants et carburants	2	Properties and specifications of standard, alternate, and drop-in fuel; properties and specifications of lubricants; fuel additives; safety precautions.
Module 15	MOTEUR À TURBINE À GAZ	15.10	Système de lubrification	2	System operation/layout and components.
Module 15	MOTEUR À TURBINE À GAZ	15.11	Système carburant moteur	2	Operation of engine control and fuel-metering systems, including electronic engine control (FADEC) and electronic power augmentation; system layout and components.
Module 15	MOTEUR À TURBINE À GAZ	15.12	Système d'air moteur	2	Operation of engine air distribution and anti-icing control systems, including internal cooling and sealing, and external air services.
Module 15	MOTEUR À TURBINE À GAZ	15.13	Systèmes de démarrage et d'allumage	2	Operation of engine start systems and components; ignition systems and components; maintenance safety requirements.
Module 15	MOTEUR À TURBINE À GAZ	15.14	Systèmes d'indication moteur	2	Exhaust gas temperature / interstage turbine temperature; engine thrust indication: engine pressure ratio, engine turbine discharge pressure or jet pipe pressure systems; oil pressure and temperature; fuel pressure and flow; engine speed; vibration measurement and indication; torque; power.
Module 15	MOTEUR À TURBINE À GAZ	15.15	Constructions alternatives de turbines	1	Geared turbofan (GTF); variable fan blades; open rotor/propfan; hybrid turbine-electric concepts and electric power augmentation; future trends and developments.
Module 15	MOTEUR À TURBINE À GAZ	15.16	Moteurs turbopropulseurs	2	Gas-coupled/free-turbine and gear-coupled turbines; reduction gears; integrated engine and propeller controls; overspeed safety devices.
Module 15	MOTEUR À TURBINE À GAZ	15.17	Moteurs turbomoteurs (turboshaft)	2	Arrangements, drive systems, reduction gearing, couplings, control systems.

Module 15	MOTEUR À TURBINE À GAZ	15.18	Groupes auxiliaires de puissance (GAP / APU)	2	Purpose, operation, protective systems.
Module 15	MOTEUR À TURBINE À GAZ	15.19	Installation de la tranche moteur (powerplant)	2	Configuration of firewalls, cowlings, acoustic panels, engine mounts, antivibration mounts, hoses, pipes, feeders, connectors, wiring looms, control cables and rods, lifting points and drains.
Module 15	MOTEUR À TURBINE À GAZ	15.20	Systèmes de protection incendie moteur	2	Operation of fire-detection and fire-extinguishing systems.
Module 15	MOTEUR À TURBINE À GAZ	15.21	Surveillance moteur et opérations au sol	3	Procedures for starting and ground run-up; interpretation of engine power output and parameters; trend (including oil analysis, vibration and borescope) monitoring; inspection of engine and components to criteria, tolerances and data specified by the engine manufacturer; compressor washing/cleaning; foreign object damage (FOD).
Module 15	MOTEUR À TURBINE À GAZ	15.22	Stockage et conservation moteur	2	Preservation and depreservation for the engine and its accessories/systems.

MODULE 17 — HÉLICE

Module 17	HÉLICE	17.1	Principes fondamentaux	2	Blade element theory; high/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.
Module 17	HÉLICE	17.2	Construction de l'hélice	2	Construction methods and materials used in wooden, composite and metal propellers; blade station, blade face, blade shank, blade back / thrust face and hub assembly; fixed pitch, controllable pitch, constant speed propeller; propeller/spinner installation.
Module 17	HÉLICE	17.3	Contrôle du pas d'hélice	2	Speed control and pitch change methods — mechanical and electrical/electronic; feathering and reverse pitch; overspeed protection.
Module 17	HÉLICE	17.4	Synchronisation des hélices	2	Synchronising and synchrophasing equipment.
Module 17	HÉLICE	17.5	Protection de l'hélice contre le givrage	2	Fluid and electrical de-icing equipment.
Module 17	HÉLICE	17.6	Entretien de l'hélice	3	Static and dynamic balancing; blade tracking; assessment of blade damage, erosion, corrosion, impact damage, delamination; propeller treatment/repair schemes; propeller
Module 17	HÉLICE	17.7	Stockage et conservation de l'hélice	2	Propeller preservation and depreservation.