

LICENCE A1

Réf.	Intitulé de l'item Sous-item (FR)	Niv. A1	Contenu détaillé (EN — texte EASA original)
MODULE 1 — MATHÉMATIQUES			
1.1	Arithmétique	1	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(a)	Algèbre — Expressions algébriques simples	1	Evaluating simple algebraic expressions, addition, subtraction, multiplication and division, use of brackets, simple algebraic fractions.
1.3(b)	Géométrie — Représentation graphique	2	Graphical representation: nature and uses of graphs, graphs of equations/functions.
MODULE 2 — PHYSIQUE			
2.1	Matière	1	Nature of matter: the chemical elements, structure of atoms, molecules; chemical compounds; states: solid, liquid, and gaseous; changes between states.
2.2.1	Mécanique — Statique	1	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).
2.2.2	Mécanique — Cinématique	1	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.
2.2.3(a)	Dynamique — Masse, force et énergie	1	Mass; force, inertia, work, power, energy (potential, kinetic and total energy), heat, efficiency.
2.2.3(b)	Dynamique — Quantité de mouvement et conservation	1	Momentum, conservation of momentum; impulse; gyroscopic principles; friction: nature and effects, coefficient of friction (rolling resistance).
2.2.4(a)	Dynamique des fluides — Pesanteur et masse volumique	2	Specific gravity and density.

2.2.4(b)	Dynamique des fluides — Viscosité, compressibilité, pressions	1	Viscosity, fluid resistance, effects of streamlining; effects of compressibility on fluids; static, dynamic, and total pressure: Bernoulli's Theorem, venturi.
2.3(a)	Thermodynamique — Température	2	Temperature: thermometers and temperature scales (Celsius, Fahrenheit and Kelvin); definition of heat.
2.3(b)	Thermodynamique — Chaleur	1	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 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.
3.2	Électricité statique et conduction	1	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.
3.3	Terminologie électrique	1	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	Production d'électricité	1	Production of electricity by the following methods: light, heat, friction, pressure, chemical reaction, magnetism, and motion.
3.5	Sources d'électricité en courant continu	1	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.
3.6	Circuits en courant continu	1	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.
3.13	Théorie du courant alternatif	1	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/square waves; single-phase/three-phase principles.

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.
5.6(a)	Architecture informatique — Terminologie et technologie	1	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).
5.11	Afficheurs électroniques	1	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).
5.12	Dispositifs sensibles aux décharges électrostatiques	1	Special handling of components sensitive to electrostatic discharges; awareness of risks and possible damage, component, and personnel antistatic protection devices.
5.15	Systèmes aéronautiques 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

6.1(a)	Matériaux ferreux — Aciers alliés utilisés en aéronautique	1	Characteristics, properties and identification of common alloy steels used in aircraft; heat treatment and application of alloy steels.
6.2(a)	Matériaux non ferreux — Caractéristiques	1	Characteristics, properties and identification of common non-ferrous materials used in aircraft; heat treatment and application of non-ferrous materials.
6.3.1(a)	Matériaux composites et non métalliques — Caractéristiques	1	Characteristics, properties and identification of common composite and non-metallic materials, other than wood, used in aircraft; sealant and bonding agents.
6.3.1(b)	Matériaux composites et non métalliques — Détection des défauts	1	Detection of defects/deterioration in composite and non-metallic materials.
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.

6.4(a)	Corrosion — Fondamentaux chimiques	1	Chemical fundamentals; formation by galvanic action process, microbiological contamination, mechanical stress.
6.4(b)	Corrosion — Types de corrosion	2	Types of corrosion and their identification; causes of corrosion; material types, and their susceptibility to corrosion.
6.5.1	Fixations — Filetages	2	Screw nomenclature; thread forms, dimensions and tolerances for standard threads used in aircraft; measuring screw threads.
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.
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.
6.5.4	Fixations — Rivets aéronautiques	1	Types of solid and blind rivets: specifications and identification, heat treatment.
6.6(a)	Tuyauteries et raccords — Identification	2	Identification and types of rigid and flexible pipes and their connectors used in aircraft.
6.6(b)	Tuyauteries et raccords — Raccords normalisés	2	Standard unions for aircraft hydraulic, fuel, oil, pneumatic and air system pipes.
6.8	Roulements	1	Purpose of bearings, loads, material, construction; types of bearings and their application.
6.9	Transmissions mécaniques	1	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	Câbles de commande	1	Types of cables; end fittings, turnbuckles and compensation devices; pulleys and cable system components; Bowden cables; aircraft flexible control systems.
6.11	Câbles électriques et connecteurs	1	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

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.
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.
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.
7.3	Potential safety hazards when working with electrical systems and protective equipment	3	Risques liés aux chocs électriques et effets du courant sur le corps humain Risques liés aux arcs électriques, aux explosions d'arc et à l'énergie stockée (condensateurs, batteries, composants électroniques de puissance) Risques liés aux batteries : risques chimiques, d'emballement thermique, d'incendie et d'explosion Risques liés aux décharges électrostatiques (DES) et aux ondes électromagnétiques
7.5	Dessins techniques, schémas et normes	1	Drawing types and diagrams, their symbols, dimensions, tolerances and projections; identification of title block information; microfilm, microfiche, and computerised presentations; Specification 100 of the Air Transport Association (ATA) of America; aeronautical and other applicable standards including ISO, AN, MS, NAS and MIL; wiring diagrams and schematic diagrams.
7.6	Ajustements et jeux fonctionnels	1	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.
7.7	Système d'interconnexion du câblage électrique (EWIS)	1	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.

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.
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.
7.18(a)	Inspection — Types de défauts et inspection visuelle	2	Types of defects and visual inspection techniques; corrosion removal, assessment and reprotection.
7.18(d)	Techniques de démontage et de remontage	2	Disassembly and reassembly techniques.
7.19(a)	Événements anormaux — Impact foudre et pénétration HIRF	2	Inspections following lightning strikes and HIRF penetration.
7.20	Procédures de maintenance	1	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.
7.21	Documentation et communication	1	Documentation: elements and criteria for writing work reports, troubleshooting reports, and shift handover instructions. Communication: clear, comprehensive, and concise.
MODULE 8 — AÉRODYNAMIQUE DE BASE			
8.1	Physique de l'atmosphère — Atmosphère standard (ISA)	1	International Standard Atmosphere (ISA), and its application to aerodynamics.
8.2	Aérodynamique	1	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.
8.3	Théorie du vol	1	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.

8.4	Écoulement à grande vitesse	1	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.
8.5	Stabilité et dynamique du vol	1	Longitudinal, lateral, and directional stability (active and passive).

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.
9.2	Performances et limitations humaines	2	Vision; hearing; information processing; attention and perception; memory; claustrophobia and physical access.
9.3	Psychologie sociale	1	Accountability and responsibility: individual and group; motivation and demotivation; peer pressure; cultural issues; teamwork; management, supervision, and leadership.
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.
9.5	Environnement physique	1	Noise and fumes; illumination; climate and temperature; motion and vibration; working environment; situational awareness.
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.
9.7	Communication	2	Within and between teams; work logging and recording; shift handover; keeping up to date, currency; dissemination of information.
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.
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.

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.
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MODULE 10 — LÉGISLATION AÉRONAUTIQUE

10.1	Cadre réglementaire	1	Role of: ICAO; the European Commission (EC); 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).
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 categories.
10.3	Organismes d'entretien agréés (OEA / Part-145, Part-CAO)	2	General understanding of Part-145 and Part-CAO.
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; MEL and 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.
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.
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.
10.8	Principes de surveillance du maintien de la navigabilité	1	Oversight principles in continuing airworthiness.
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

11.1(a)	Théorie du vol — Aérodynamique de l'avion et commandes de vol	1	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.
11.1(b)	Théorie du vol — Autres dispositifs aérodynamiques de l'avion	1	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.
11.2(a)	Structures de cellule (ATA 51) — Concepts généraux	2	Zonal and station identification systems; electrical bonding; lightning strike protection provisions.
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.
11.2(c)	Structures de cellule (ATA 51) — Méthodes de construction	1	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.
11.3.1(a)	Fuselage, portes, hublots (ATA 52/53/56) — Principes de construction	1	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.
11.3.1(b)	Fuselage — Dispositifs de remorquage aérien	1	Airborne towing devices (glider, banner, target).
11.3.1(c)	Portes et sorties de secours	1	Doors and emergency exits: safety devices; cargo loading system.
11.3.2	Voilure (ATA 57)	1	Construction; fuel storage; landing gear, pylon, control surface and high lift/drag attachments.
11.3.3	Empennages (ATA 55)	1	Construction; control surface attachment.

11.3.4	Surfaces de commande de vol (ATA 55/57)	1	Construction and attachments; balancing — mass and aerodynamics.
11.3.5	Nacelles et pylônes (ATA 54)	1	Nacelles/pylons: construction, firewalls, engine mounts.
11.4(a)	Conditionnement d'air et pressurisation (ATA 21) — Pressurisation	1	Pressurisation systems; cabin pressure controllers, control, and safety valves; control and indication.
11.4(b)	Conditionnement d'air et pressurisation (ATA 21) — Alimentation en air	1	Sources of air supply including engine bleed, APU and ground cart; distribution systems.
11.4(c)	Conditionnement d'air et pressurisation (ATA 21) — Climatisation	1	Air-conditioning systems; air cycle and vapour cycle machines; flow, temperature and humidity control system; control and indication control valves.
11.4(d)	Conditionnement d'air et pressurisation (ATA 21) — Sécurité et alarmes	1	Protection and warning devices.
11.5.1	Instruments (ATA 31)	1	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.
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. Types and uses of avionics general test equipment.
11.6	Alimentation électrique (ATA 24)	1	Installation and operation of batteries; DC power generation; AC power generation; emergency power generation; voltage regulation; power distribution; inverters, transformers, rectifiers; circuit protection; external/ground power.
11.7(a)	Équipements et aménagements (ATA 25) — Équipements de secours	2	Emergency equipment requirements.

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.
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.
11.8(b)	Protection incendie (ATA 26) — Extincteurs portatifs	1	Portable fire extinguisher.
11.9(a)	Commandes de vol (ATA 27) — Commandes primaires et secondaires	1	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.
11.9(b)	Commandes de vol (ATA 27) — Actionnement et protection	1	Active load control; lift dump, speed brakes; hydraulic, pneumatic systems; stall-protection systems.
11.9(c)	Commandes de vol (ATA 27) — Fonctionnement du système	1	Electrical systems, fly-by-wire systems.
11.9(d)	Commandes de vol (ATA 27) — Équilibrage et réglage	1	Balancing and rigging.
11.10(a)	Systèmes carburant (ATA 28/47) — Architecture du système	1	System layout; fuel tanks; supply systems.
11.10(b)	Systèmes carburant (ATA 28/47) — Gestion du carburant	1	Cross-feed and transfer; refuelling and defuelling.
11.10(c)	Systèmes carburant (ATA 28/47) — Indications et alarmes	1	Indication and warnings.
11.10(d)	Systèmes carburant (ATA 28/47) — Systèmes spéciaux	1	Dumping, venting, and draining; inert gas systems.
11.10(e)	Systèmes carburant (ATA 28/47) — Équilibrage longitudinal	1	Longitudinal balance fuel systems.

11.11(a)	Système hydraulique (ATA 29) — Description du système	1	System layout; hydraulic fluids; hydraulic reservoirs and accumulators; filters; power distribution.
11.11(b)	Système hydraulique (ATA 29) — Fonctionnement (1)	1	Pressure generation: electric and mechanical; pressure control; indication and warning systems; servicing.
11.11(c)	Système hydraulique (ATA 29) — Fonctionnement (2)	1	Pressure generation: pneumatic; emergency pressure generation; interface with other systems.
11.12(a)	Protection givrage et pluie (ATA 30) — Principes	1	Ice formation, classification, and detection.
11.12(b)	Protection givrage et pluie (ATA 30) — Dégivrage	1	De-icing systems: electrical, hot-air, pneumatic, chemical; probe and drain heating.
11.12(c)	Protection givrage et pluie (ATA 30) — Antigivrage	1	Anti-icing systems: electrical, hot-air, chemical.
11.12(d)	Protection givrage et pluie (ATA 30) — Essuie-glaces	1	Wiper systems.
11.12(e)	Protection givrage et pluie (ATA 30) — Répulsif de pluie	1	Rain-repellent systems.
11.13(a)	Train d'atterrissage (ATA 32) — Description	2	Construction, shock absorbing; tyres.
11.13(b)	Train d'atterrissage (ATA 32) — Fonctionnement du système	2	Extension and retraction systems: normal and emergency; indications and warnings; wheels, brakes, antiskid, and autobraking; steering.
11.13(c)	Train d'atterrissage (ATA 32) — Détection sol/air	2	Air-ground sensing.
11.13(d)	Train d'atterrissage (ATA 32) — Protection de l'empennage arrière	2	Tail protection: skids.
11.14	Éclairage (ATA 33)	2	External: navigation, anticollision, landing, taxiing, ice; internal: cabin, cockpit, cargo; emergency.

11.15	Oxygène (ATA 35)	1	System layout: cockpit, cabin; sources, storage, charging and distribution; supply regulation; indications and warnings.
11.16(a)	Pneumatique / dépression (ATA 36) — Systèmes	1	System layout; sources: engine/APU, compressors, reservoirs, ground supply; pressure control; distribution; indications and warnings; interface with other systems.
11.16(b)	Pneumatique / dépression (ATA 36) — Pompes	1	Pressure and vacuum pumps.
11.17(a)	Eau et déchets (ATA 38) — Systèmes	2	Water system layout, supply, distribution, servicing and draining; toilet system layout, flushing and servicing.
11.17(b)	Eau et déchets (ATA 38) — Corrosion	2	Corrosion aspects.
11.18	Systèmes de maintenance embarqués — CMC (ATA 45)	1	Central maintenance computers; data-loading system; electronic library system; printing systems; structure monitoring (damage-tolerance monitoring).
11.19(a)	Avionique modulaire intégrée — AMI (ATA 42) — Description et théorie	1	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.
11.19(b)	Avionique modulaire intégrée — AMI (ATA 42) — Architectures types	1	Typical system layouts.
11.20	Systèmes cabine (ATA 44)	1	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.

11.21	Systèmes d'information (ATA 46)	1	System architecture, operation, and control of: storage and electronic library; updating; retrieving of digital information; ATIMS and network server systems; aircraft general information system; flight deck information system; maintenance information system; passenger cabin information system; miscellaneous information systems; other linked systems.
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MODULE 15 — MOTEUR À TURBINE À GAZ

15.1	Principes fondamentaux	1	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.
15.3	Entrée d'air (inlet)	2	Compressor inlet ducts; effects of various inlet configurations; ice protection.
15.4	Compresseurs	1	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.
15.5	Chambre de combustion	1	Constructional features and principles of operation.
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.
15.7	Tuyère d'échappement	1	Constructional features and principles of operation; convergent, divergent, and variable area nozzles; engine noise reduction; thrust reversers.
15.9	Lubrifiants et carburants	1	Properties and specifications of standard, alternate, and drop-in fuel; properties and specifications of lubricants; fuel additives; safety precautions.
15.10	Système de lubrification	1	System operation/layout and components.
15.11	Système carburant moteur	1	Operation of engine control and fuel-metering systems, including electronic engine control (FADEC) and electronic power augmentation; system layout and components.

15.12	Système d'air moteur	1	Operation of engine air distribution and anti-icing control systems, including internal cooling and sealing, and external air services.
15.13	Systèmes de démarrage et d'allumage	1	Operation of engine start systems and components; ignition systems and components; maintenance safety requirements.
15.14	Systèmes d'indication moteur	1	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.
15.16	Moteurs turbopropulseurs	1	Gas-coupled/free-turbine and gear-coupled turbines; reduction gears; integrated engine and propeller controls; overspeed safety devices.
15.17	Moteurs turbomoteurs (turboshaft)	1	Arrangements, drive systems, reduction gearing, couplings, control systems.
15.18	Groupes auxiliaires de puissance (GAP / APU)	1	Purpose, operation, protective systems.
15.19	Installation de la tranche moteur (powerplant)	1	Configuration of firewalls, cowlings, acoustic panels, engine mounts, antivibration mounts, hoses, pipes, feeders, connectors, wiring looms, control cables and rods, lifting points and drains.
15.20	Systèmes de protection incendie moteur	1	Operation of fire-detection and fire-extinguishing systems.
15.21	Surveillance moteur et opérations au sol	1	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 17 — HÉLICE

17.1	Principes fondamentaux	1	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.
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17.2	Construction de l'hélice	1	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.
17.3	Contrôle du pas d'hélice	1	Speed control and pitch change methods — mechanical and electrical/electronic; feathering and reverse pitch; overspeed protection.
17.5	Protection contre le givrage	1	Fluid and electrical de-icing equipment.
17.6	Entretien de l'hélice	1	Static and dynamic balancing; blade tracking; assessment of blade damage, erosion, corrosion, impact damage, delamination; propeller treatment/repair schemes; propeller engine running.
17.7	Stockage et conservation	1	Propeller preservation and depreservation.