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DGLV / DGTA

4/14/2023



Belgian CAA Part-66 Credit Report: Template / Applicant

# Text Description automatically generatedBelgian CAA Part-66 Credit Report

# Introduction

This document is to be completed by anybody having the intention to obtain credits for (sub)modules required for an EASA Part-66 license, after a relevant course has been passed. This report can only be reviewed by the Belgian CAA for courses taken in Belgium. For courses taken in any other country, contact should be taken with the authority of that country.

This document is not to be used when the training was performed in an EASA Part-147 approved organisation.

This report only covers basic knowledge requirements and the evaluation if an individual can be considered as a skilled worker. The evaluation of basic experience is not part of this document, and should be recorded as indicated on [our website](https://mobilit.belgium.be/nl/luchtvaart/vergunningen-en-erkenningen-personen/onderhoudslicenties-luchtvaartuigen-volgens-easa-0).

This document is composed in line with EASA Part-66 Subpart B, Section E.

# Applicant details

Name of the applicant: ……………………………..

National Registry Number: ……………………….

Address: ……………………..

……………………

……………………

Telephone number: ……………

Qualification obtained (= text indicated on diploma/certificate, please supply scan as attachment): ………………………………………………………..

Institute(s) where the course(s) has/have been taken (the Belgian CAA can only issue credits for knowledge obtained in Belgium): …………………………………………

Graduation year: …………………………

# Completion instruction

This document is supplied in “.docx” so it can be used easily. No information should be removed from the document. Items which are not applicable should be left empty.

In the “Syllabus” column, please indicate the course material used to cover the detailed subject.

In the “Level” column, indicate at which level you estimate the content of the coverage of the subject. There are 4 possible entries, the exact meaning of which can be found in Appendix 1 to Part-66. Each item within a sub-module should be handled at least at the level indicated.

Summarized:

Level 1 (L1) : Familiarisation

Level 2 (L2): General knowledge

Level 3 (L3): Detailed knowledge

(NE): No credits are requested

The practical training part at the end of the document is optional, but when evaluated positively it will result in the qualification as “skilled worker”, including the reduction in required experience further on in the process of obtaining a Part-66 license. The intention of the table is to get an insight of the practical elements covered during the training, related to the manufacturing, repair, overhaul or inspection of mechanical, electrical or electronic equipment. The use of tools and measuring devices should also be explained. If certain aspects were not covered during the training, they should be left empty. There is no need to complete all cases (but the more the better).

The document should be sent as a .pdf, so that no changes are possible afterwards.

# Evaluation procedure

The credit report should be sent to the BCAA by e-mail to [part66@mobilit.fgov.be](mailto:part66@mobilit.fgov.be). After receipt of this document, a payment invitation will be sent. The file will be reviewed after the payment is received. Payment does not guarantee a positive outcome of the review. The evaluation of the report will be performed taking into account the EASA Part-66 requirements valid at the date of signature of the credit attestation, as defined in the appendices I and VII to Part-66.

During the evaluation process, samples of the course materials will be requested to be supplied to the BCAA. Depending on the format, this can be physical books, or electronic documents.

All course material should be held available by the applicant for a possible review.

For the practical training, a general evaluation will be performed to assure applicants can be expected to be competent to manufacture, repair, overhaul or inspect mechanical, electrical or electronical equipment, and be able to use various tools.

Information not indicated in this document will be considered as non-existent.

The review will be performed in line with Part-66 section B, Subpart E.

# Evaluation result

After the evaluation of the above mentioned documents, the BCAA will issue a document indicating for each submodule the obtained credit level. These credits issued to an applicant will remain valid for 10 years after issuance of the attestation of credits.

A positive evaluation of the practical training will result in the qualification as “skilled worker”, allowing a reduction in the required experience further in the process of obtaining the Part-66 license.

An indication of the missing modules can be given for a specific license category. This information is only for information purposes, and will be re-evaluated at the time the application for a license is made.

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## Template Revision History

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| Revision | Changes: |
| 04/2023 | Initial revision |

Latest modifications are indicated in red

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| --- | --- | --- | --- | --- | --- | --- |
| Module 1 : Mathematics | |  | Level | | | |
| Sub module | Subject | Syllabus | L1 | L2 | L3 | NE |
| 1.1 Arithmetic | 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) Algebra | Evaluating simple algebraic expressions, addition, subtraction, multiplication and division, use of brackets, simple algebraic fractions; |  |  |  |  |  |
| 1.2 (b) Algebra | 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; |
| 1.3 (a) Geometry | Simple geometrical constructions; |  |  |  |  |  |
| 1.3 (b) Geometry | Graphical representation; nature and uses of graphs, graphs of equations/functions; |  |  |  |  |  |
| 1.3 (c) Geometry | Simple trigonometry; trigonometrical relationships, use of tables and rectangular and polar coordinates. |  |  |  |  |  |

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| Module 2 : Physics | |  | Level | | | |
| Sub module | Subject | Syllabus | L1 | L2 | L3 | NE |
| 2.1 Matter | Nature of matter: the chemical elements, structure of atoms, molecules; |  |  |  |  |  |
| Chemical compounds. |
| States: solid, liquid and gaseous; |
| Changes between states. |
| 2.2.1 Statics | 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 | 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) Dynamics | Mass |  |  |  |  |  |
| Force, inertia, work, power, energy (potential, kinetic and total energy), heat, efficiency; |
| 2.2.3 (b) Dynamics | Momentum, conservation of momentum; |  |  |  |  |  |
| Impulse; |
| Gyroscopic principles; |
| Friction: nature and effects, coefficient of friction (rolling resistance). |
| 2.2.4 (a) Fluid dynamics | Specific gravity and density; |  |  |  |  |  |
| 2.2.4 (b) Fluid dynamics | Viscosity, fluid resistance, effects of streamlining; |  |  |  |  |  |
| Effects of compressibility on fluids; |
| Static, dynamic and total pressure: Bernoulli's Theorem, venturi. |
| 2.3 (a) Thermodynamics | Temperature: thermometers and temperature scales:  Celsius, Fahrenheit and Kelvin; Heat definition. |  |  |  |  |  |
| 2.3 (b) Thermodynamics | 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. |
| 2.4 Optics (light) | Nature of light; speed of light; |  |  |  |  |  |
| Laws of reflection and refraction: reflection at plane surfaces, reflection by spherical mirrors, refraction, lenses; |
| Fibre optics. |
| 2.5 wave motion and sound | Wave motion: mechanical waves, sinusoidal wave motion, interference phenomena, standing waves; |  |  |  |  |  |
| Sound: speed of sound, production of sound, intensity, pitch and quality, Doppler effect. |

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| Module 3 : Electrical Fundamentals | | | |  | | Level | | | | | | |
| Sub module | | Subject | | Syllabus | | L1 | | L2 | | L3 | | NE |
| 3.1 Electron Theory | | Structure and distribution of electrical charges within: atoms, molecules, ions, compounds; | |  | |  | |  | |  | |  |
| Molecular structure of conductors, semiconductors and insulators. | |
| 3.2 Static Electricity and Conduction | | 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 a vacuum. | |
| 3.3 Electrical Terminology | | 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 | | Production of electricity by the following methods: light, heat, friction, pressure, chemical action, magnetism and motion. | |  | |  | |  | |  | |  |
| 3.5 DC Sources of Electricity | | 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 | | 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(a) Resistance/Resistor | | 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. | |
| 3.7(b) Resistance/Resistor | | 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; | |
| 3.8 Power | | Power, work and energy (kinetic and potential) | |  | |  | |  | |  | |  |
| Dissipation of power by a resistor | |
| Power formula | |
| Calculations involving power, work and energy | |
| 3.9 Capacitance / Capacitor | 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 | |
| Testing of capacitors | |
| 3.10(a) Magnetism | 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 | |
| 3.10(b) Magnetism | 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 | |
| 3.11 Inductance/ Inductor | 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/Generator theory | 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 | 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 / 3 phase principles | |
| 3.14 Resistive (R), Capacitive (C) and Inductive (L) circuit | 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 | |
| 3.15 Transformers | 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 three phase system | |
| Primary and Secondary current, voltage, turns ratio, power, efficiency | |
| Auto transformers | |
| 3.16 Filters | Operation, application and uses of the following filters: low pass, high pass, band pass, band stop. | |  | |  | |  | |  | |  | |
| 3.17 AC Generators | 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 connections advantages and uses | |
| Permanent Magnet Generators | |
| 3.18 AC Motors | 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 | |

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| Module 4 : Electronic Fundamentals | |  | Level | | | | |
| Sub module | Subject | Syllabus | L1 | L2 | L3 | NE |
| 4.1.1(a) Diodes | 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 |
| 4.1.1(b) Diodes | Materials, electron configuration, electrical properties |  |  |  |  |  |
| P and N type materials: effects of impurities on conduction, majority and minority characters; |
| PN junction in a semiconductor, development of a potential across a PN junction in unbiased, forward biased and reverse biased conditions |
| Diode parameters: peak inverse voltage, maximum forward current, temperature, frequency, leakage current, power dissipation |
| Operation and function of diodes in the following circuits: clippers, clampers, full and half wave rectifiers, bridge rectifiers, voltage doublers and triplers |
| Detailed operation and characteristics of the following devices: silicon controlled rectifier (thyristor), light emitting diode, Shottky diode, photo conductive diode, varistor rectifier diodes, Zener diode |
| 4.1.2(a) Transistors | Transistor symbols |  |  |  |  |  |
| Component description and orientation |
| Transistor characteristics and properties |
| 4.1.2(b) Transistors | Construction and operation of PNP and NPN transistors |  |  |  |  |  |
| Base, collector and emitter configurations |
| Testing of transistors |
| Basic appreciation of other transistor types and their uses |
| Application of transistors: classes of amplifier (A, B, C) |
| Simple circuits including: bias, decoupling, feedback and stabilisation |
| Multistage circuit principles: cascades, push-pull, oscillators, multivibrators, flip-flop circuits |
| 4.1.3(a) Integrated circuits | Description and operation of logic circuits and linear circuits / operational amplifiers |  |  |  |  |  |
| 4.1.3(b) Integrated circuits | Description and operation of logic circuits and linear circuits |  |  |  |  |  |
| Introduction to operation and function of an operational amplifier used as: integrator, differentiator, voltage follower, comparator |
| Operation and amplifier stages connecting methods: resistive capacitive, inductive (transformer), inductive resistive (IR), direct |
| Advantages and disadvantages of positive and negative feedback |
| 4.2 Printed circuit boards | Description and use of printed circuit boards. |  |  |  |  |  |
| 4.3(a) Servo mechanisms | 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 / features: resolvers, differential, control and torque, transformers, inductance and capacitance transmitters |
| 4.3(b) Servo mechanisms | Understanding of the following terms: Open and closed loop, follow up, servomechanism, analogue transducer, null , damping, feedback, deadband |  |  |  |  |  |
| Construction operation and use of the following synchro system components: resolvers, differential, control and torque, E and I transformers, inductance transmitters, capacitance transmitters, synchronous transmitters |
| Servomechanism defects, reversal of synchro leads, hunting |

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| Module 5 : Digital techniques , Electronic instrument Systems | |  | Level | | | |
| Sub module | Subject | Syllabus | L1 | L2 | L3 | NE |
| 5.1 Electronic instrument systems | Typical systems arrangements and cockpit layout of electronic instrument systems. |  |  |  |  |  |
| 5.2 Numbering systems | Numbering systems: binary, octal and hexadecimal |  |  |  |  |  |
| Demonstration of conversions between the decimal and binary, octal and hexadecimal systems and vice versa |
| 5.3 Data conversion | Analogue Data, Digital Data |  |  |  |  |  |
| Operation and application of analogue to digital, and digital to analogue converters inputs and outputs, limitations of various types |
| 5.4 Data buses | Operation of data buses in aircraft systems including knowledge of ARINC and other specifications |  |  |  |  |  |
| Aircraft Network/Ethernet |
| 5.5(a) Logic circuits | Identification of common logic gate symbols, tables and equivalent circuits |  |  |  |  |  |
| Applications used for aircraft systems, schematic diagrams |
| 5.5(b) Logic circuits | Interpretation of logic diagrams |  |  |  |  |  |
| 5.6(a) Basic computer structure | 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) |
| 5.6(b) Basic computer structure | Computer related terminology |  |  |  |  |  |
| Operation, layout and interface of the major components in a micro computer including their associated bus systems |
| Information contained in single and multiaddress instruction words |
| Memory associated terms |
| Operation of typical memory devices |
| Operation, advantages and disadvantages of the various data storage systems |
| 5.7 Microprocessors | Functions performed and overall operation of a microprocessor |  |  |  |  |  |
| Basic operation of each of the following microprocessor elements: control and processing unit, clock, register, arithmetic logic unit |
| 5.8 Integrated circuits | Operation and use of encoders and decoders |  |  |  |  |  |
| Function of encoder types |
| Uses of medium, large and very large scale integration |
| 5.9 Multiplexing | Operation, application and identification in logic diagrams of multiplexers and demultiplexers. |  |  |  |  |  |
| 5.10 Fibre optics | 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 | Principles of operation of common types of displays used in modern aircraft: Cathode Ray Tubes, Light Emitting Diodes, Liquid Crystal Display |  |  |  |  |  |
| 5.12 Electrostatic sensitive devices | 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 | Awareness of restrictions, airworthiness requirements and possible catastrophic effects of unapproved changes to software programmes. |  |  |  |  |  |
| 5.14 Electromagnetic environment | Influence of the following phenomena on maintenance practices for electronic system:  EMC – Electromagnetic Compatibility |  |  |  |  |  |
| EMI – Electromagnetic Interference |
| HIRF – High Intensity Radiated Field |
| Lightning / lightning protection |
| 5.15 Typical electronic/digital aircraft systems (a) | General arrangement of typical electronic/digital aircraft systems and associated BITE (Built In Test Equipment) such as: |  |  |  |  |  |
| ACARS – ARINC Communication and Addressing and Reporting System |
| EICAS – Engine Indication and Crew Alerting System |
| FBW – Fly by Wire |
| FMS – Flight Management System |
| IRS – Inertial Reference System |
| 5.15 Typical electronic/digital aircraft systems (b) | General arrangement of typical electronic/digital aircraft systems and associated BITE (Built In Test Equipment) such as: |  |  |  |  |  |
| ECAM – Electronic Centralised Aircraft Monitoring |
| EFIS – Electronic Flight Instrument System |
| GPS – Global Positioning System |
| TCAS – Traffic Alert Collision Avoidance System |
| Integrated Modular Avionics |
| Cabin Systems |
| Information Systems |

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| Module 6 : Materials and Hardware | |  | Level | | | |
| Sub module | Subject | Syllabus | L1 | L2 | L3 | NE |
| 6.1(a) Aircraft materials - Ferrous | Characteristics, properties and identification of common alloy steels used in aircraft |  |  |  |  |  |
| Heat treatment and application of alloys steels |
| 6.1(b) Aircraft materials - Ferrous | Testing of ferrous materials for hardness, tensile strength, fatigue strength and impact resistance |  |  |  |  |  |
| 6.2(a) Aircraft materials – Non-Ferrous | Characteristics, properties and identification of common non-ferrous materials used in aircraft |  |  |  |  |  |
| Heat treatment and application of non-ferrous materials |
| 6.2(b) Aircraft materials – Non-Ferrous | Testing of non-ferrous material for hardness tensile strength, fatigue strength and impact resistance |  |  |  |  |  |
| 6.3.1(a) Aircraft materials – Composite and non-metallic | Characteristics, properties and identification of common composite and non-metallic materials, other than wood, used in aircraft |  |  |  |  |  |
| Sealants and bonding agents |
| 6.3.1(b) Aircraft materials – Composite and non-metallic | The detection of defects in composite and non-metallic material |  |  |  |  |  |
| Repair of composite and non-metallic material |
| 6.3.2 Aircraft materials – Composite and non-metallic Wooden structures | Construction methods of wooden airframe structures |  |  |  |  |  |
| Characteristics, properties and types of wood and glue used in aeroplanes |
| Preservation and maintenance of wooden structures |
| Type of defects in wood material and wooden structures |
| The detection of defects in wooden structure |
| Repair of wooden structure |
| 6.3.3 Aircraft materials – Composite and non-metallic Fabric covering | Characteristics, properties and types of fabrics used in aeroplanes |  |  |  |  |  |
| Inspection methods for fabrics |
| Type of defects in fabrics |
| Repair of fabric covering |
| 6.4(a) Corrosion | Chemical fundamentals |  |  |  |  |  |
| Formation by galvanic action process, microbiological, stress |
| 6.4(b) Corrosion | Types of corrosion and their identification |  |  |  |  |  |
| Causes of corrosion |
| Material types, susceptibility to corrosion |
| 6.5.1 Fasteners Screw threads | Screw nomenclature |  |  |  |  |  |
| Thread forms, dimensions and tolerances for standard threads used in aircraft |
| Measuring screw threads |
| 6.5.2 Fasteners Bolts, studs and screws | 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 Fasteners  Locking Devices | Tab and spring washers, Locking plates, Split pins, Pal-nuts, Wire locking, Quick release fasteners, Keys, Circlips, Cotter pins |  |  |  |  |  |
| 6.5.4  Aircraft rivets | Types of solid and blind rivets: specifications and identification, heat treatment |  |  |  |  |  |
| 6.6(a) Pipes and unions | Identification of, and types of rigid and flexible pipes used in aircraft |  |  |  |  |  |
| 6.6(b) Pipes and unions | Standard unions for aircraft hydraulic, fuel, oil, pneumatic, air system pipes |  |  |  |  |  |
| 6.7 Springs | Types of springs, Materials, Characteristics and Applications |  |  |  |  |  |
| 6.8 Bearings | Purpose of bearings, loads, Material, construction |  |  |  |  |  |
| Types of bearings and their application |
| 6.9 Transmissions | 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 | Types of cables |  |  |  |  |  |
| End fittings, turnbuckles and compensation devices |
| Pulleys and cable system components |
| Bowden cables |
| Aircraft flexible control systems |
| 6.11 Electrical cables and connectors | Cable types, construction and characteristics |  |  |  |  |  |
| High tension cables and Co-axial cables |
| Crimping |
| Connector types, pins, plugs, sockets, insulators current and voltage rating, coupling, identification codes |

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| Module 7A : Maintenance Practices | |  | Level | | |  |
| Sub module | Subject | Syllabus | L1 | L2 | L3 | NE |
| 7.1 Safety precautions – Aircraft and workshop | 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 | 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 | 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 | Operation, function and use of avionic general test equipment. |  |  |  |  |  |
| 7.5 Engineering drawings, diagrams and standards | Drawing types and diagrams, their symbols, dimensions, tolerances and projections |  |  |  |  |  |
| Identifying 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 Fits and clearances | 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) | 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 type, 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, inspections, repair, maintenance and cleanliness standards |
| 7.8 Riveting | Riveted joints, rivet spacing and pitch |  |  |  |  |  |
| Tools used for riveting and dimpling |
| Inspection of riveted joints |
| 7.9 Pipes and hoses | Bending and belling/flaring aircraft pipes |  |  |  |  |  |
| Inspection and testing of aircraft pipes and hoses |
| Installation and clamping of pipes |
| 7.10 Springs | Inspection and testing of springs |  |  |  |  |  |
| 7.11 Bearings | Testing, cleaning and inspection of bearings |  |  |  |  |  |
| Lubrication requirements of bearings |
| Defects in bearings and their causes |
| 7.12 Transmissions | 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 | Swaging of end fittings |  |  |  |  |  |
| Inspection and testing of control cables |
| Bowden cables, Aircraft flexible control systems |
| 7.14.1 Material handling- sheet metal | Marking out and calculation of bend allowance |  |  |  |  |  |
| Sheet metal working, including bending and forming |
| Inspection of sheet metal work |
| 7.14.2 Material handling – composite and non-mettalic | Bonding practices |  |  |  |  |  |
| Environmental conditions |
| Inspection methods |
| 7.15(a) Welding, brazing, soldering and bonding | Soldering methods, Inspection of soldered joints |  |  |  |  |  |
| 7.15(b) Welding, brazing, soldering and bonding | Welding and brazing methods |  |  |  |  |  |
| Inspection of welded and brazed joints |
| Bonding methods and Inspection of bonded joints |
| 7.16(a) Aircraft weight and balance | Centre of Gravity / Balance limits calculation: use of relevant documents |  |  |  |  |  |
| 7.16(b) Aircraft weight and balance | Preparation of aircraft for weighing |  |  |  |  |  |
| Aircraft weighing |
| 7.17 Aircraft handling and storage | 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) Disassembly, inspection, repair and assembly techniques | Types of defects and visual inspection techniques |  |  |  |  |  |
| Corrosion removal, assessment and reprotection |
| 7.18(b) Disassembly, inspection, repair and assembly techniques | General repair methods, Structural Repair Manual |  |  |  |  |  |
| Ageing, fatigue and corrosion control programmes |
| 7.18(c) Disassembly, inspection, repair and assembly techniques | Non destructive inspection techniques: penetrant, radiographic, eddy current, ultrasonic and boroscope methods |  |  |  |  |  |
| 7.18(d) Disassembly, inspection, repair and assembly techniques | Disassembly and re-assembly techniques. |  |  |  |  |  |
| 7.18(e) Disassembly, inspection, repair and assembly techniques | Trouble shooting techniques. |  |  |  |  |  |
| 7.19(a) Abnormal events | Inspections following lightning strikes and HIRF penetration |  |  |  |  |  |
| 7.19(b) Abnormal events | Inspections following abnormal events such as heavy landings and flight through turbulence |  |  |  |  |  |
| 7.20 Maintenance procedures | 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 |

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| Module 7B : Maintenance Practices | |  | Level | | | |
| Sub module | Subject | Syllabus | L1 | L2 | L3 | NE |
| 7.1 Safety precautions – Aircraft and workshop | 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 | 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 | 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 | Operation, function and use of avionic general test equipment. |  |  |  |  |  |
| 7.5 Engineering drawings, diagrams and standards | Drawing types and diagrams, their symbols, dimensions, tolerances and projections |  |  |  |  |  |
| Identifying 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 Fits and clearances | 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 cables and connectors | 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; |
| Wiring protection techniques: Cable looming and loom support, cable clamps, protective sleeving techniques including heat shrink, wrapping shielding |
| 7.8 Riveting | Riveted joints, rivet spacing and pitch |  |  |  |  |  |
| Tools used for riveting and dimpling |
| Inspection of riveted joints |
| 7.9 Pipes and hoses | Bending and belling/flaring aircraft pipes |  |  |  |  |  |
| Inspection and testing of aircraft pipes and hoses |
| Installation and clamping of pipes |
| 7.10 Springs | Inspection and testing of springs |  |  |  |  |  |
| 7.11 Bearings | Testing, cleaning and inspection of bearings |  |  |  |  |  |
| Lubrication requirements of bearings |
| Defects in bearings and their causes |
| 7.12 Transmissions | 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 | Swaging of end fittings |  |  |  |  |  |
| Inspection and testing of control cables |
| Bowden cables, Aircraft flexible control systems |
| 7.14.1 Material handling – Sheet Metal | Marking out and calculation of bend allowance |  |  |  |  |  |
| Sheet metal working, including bending and forming |
| Inspection of sheet metal work |
| 7.14.2 Material handling – Composite and non-metallic | Bonding practices |  |  |  |  |  |
| Environmental conditions |
| Inspection methods |
| 7.15(a) Welding, brazing, soldering and bonding | Soldering methods, Inspection of soldered joints |  |  |  |  |  |
| 7.15(b) Welding, brazing, soldering and bonding | Welding and brazing methods |  |  |  |  |  |
| Inspection of welded and brazed joints |
| Bonding methods and Inspection of bonded joints |
| 7.16(a) Aircraft weight and balance | Centre of Gravity / Balance limits calculation: use of relevant documents |  |  |  |  |  |
| 7.16(b) Aircraft weight and balance | Preparation of aircraft for weighing |  |  |  |  |  |
| Aircraft weighing |
| 7.17 Aircraft handling and storage | 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) Disassembly, inspection, repair and assembly techniques | Types of defects and visual inspection techniques |  |  |  |  |  |
| Corrosion removal, assessment and reprotection |
| 7.18(b) Disassembly, inspection, repair and assembly techniques | General repair methods, Structural Repair Manual |  |  |  |  |  |
| Ageing, fatigue and corrosion control programmes |
| 7.18(c) Disassembly, inspection, repair and assembly techniques | Non destructive inspection techniques: penetrant, radiographic, eddy current, ultrasonic and boroscope methods |  |  |  |  |  |
| 7.18(d) Disassembly, inspection, repair and assembly techniques | Disassembly and re-assembly techniques. |  |  |  |  |  |
| 7.18(e) Disassembly, inspection, repair and assembly techniques | Trouble shooting techniques. |  |  |  |  |  |
| 7.19(a) Abnormal events | Inspections following lightning strikes and HIRF penetration |  |  |  |  |  |
| 7.19(b) Abnormal events | Inspections following abnormal events such as heavy landings and flight through turbulence |  |  |  |  |  |
| 7.20 Maintenance procedures | 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 |

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| Module 8 : Basic Aerodynamics | |  | Level | | | |
| Sub module | Subject | Syllabus | L1 | L2 | L3 | NE |
| 8.1 Physics of the atmosphere | International Standard Atmosphere (ISA), application to aerodynamics |  |  |  |  |  |
| 8.2 Aerodynamics | 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, frost. |
| 8.3 Theory of flight | 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 Flight stability and dynamics | Longitudinal, lateral and directional stability (active and passive) |  |  |  |  |  |

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| Module 9A: Human Factors | |  | Level | | | |
| Sub module | Subject | Syllabus | L1 | L2 | L3 | NE |
| 9.1 General | The need to take human factors into account; |  |  |  |  |  |
| Incidents attributable to human factors/human error; |
| “Murphy's” law. |
| 9.2 Human Performance and Limitations | Vision; |  |  |  |  |  |
| Hearing; |
| Information processing; |
| Attention and perception; |
| Memory; |
| Claustrophobia and physical access. |
| 9.3 Social Psychology | Responsibility: individual and group; |  |  |  |  |  |
| Motivation and de-motivation; |
| Peer pressure; |
| “Culture” issues; |
| Team working; |
| Management, supervision and leadership. |
| 9.4 Factors Affecting Performance | Fitness/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 | Noise and fumes; |  |  |  |  |  |
| Illumination; |
| Climate and temperature; |
| Motion and vibration; |
| Working environment. |
| 9.6 Tasks | Physical work; |  |  |  |  |  |
| Repetitive tasks; |
| Visual inspection; |
| Complex systems. |
| 9.7 Communication | Within and between teams; |  |  |  |  |  |
| Work logging and recording; |
| Keeping up to date, currency; |
| Dissemination of information. |
| 9.8 Human Error | 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 | Recognising and avoiding hazards; |  |  |  |  |  |
| Dealing with emergencies. |

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| Module 9B: Human Factors | |  | Level | | | |
| Sub module | Subject | Syllabus | L1 | L2 | L3 | NE |
| 9.1 General | The need to take human factors into account; |  |  |  |  |  |
| Incidents attributable to human factors/human error; |
| Murphy's’ law. |
| 9.2 Human Performance and Limitations | Vision; |  |  |  |  |  |
| Hearing; |
| Information processing; |
| Attention and perception; |
| Memory; |
| Claustrophobia and physical access. |
| 9.3 Social Psychology | Responsibility: individual and group; |  |  |  |  |  |
| Motivation and de-motivation; |
| Peer pressure; |
| ‘Culture’ issues; |
| Team working; |
| Management, supervision and leadership. |
| 9.4 Factors Affecting Performance | Fitness/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 | Noise and fumes; |  |  |  |  |  |
| Illumination; |
| Climate and temperature; |
| Motion and vibration; |
| Working environment. |
| 9.6 Tasks | Physical work; |  |  |  |  |  |
| Repetitive tasks; |
| Visual inspection; |
| Complex systems. |
| 9.7 Communication | Within and between teams; |  |  |  |  |  |
| Work logging and recording; |
| Keeping up to date, currency; |
| Dissemination of information. |
| 9.8 Human Error | 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 | Recognising and avoiding hazards; |  |  |  |  |  |
| Dealing with emergencies. |

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| Module 10 : Aviation Legislation | |  | Level | | | |
| Sub module | Subject | Syllabus | L1 | L2 | L3 | NE |
| 10.1 Regulatory framework | Role of International Civil Aviation Organisation; |  |  |  |  |  |
| Role of the European Commission |
| Role of EASA; |
| Role of the Member States and National Aviation Authorities; |
| Regulations (EU) 2018/1139, Regulation (EU) No 748/2012, Regulation (EU) No 1321/2014 and Regulation (EU) No 376/2014; |
| Relation between the various Annexes (Parts) of Regulation (EU) No 748/2012, Regulation (EU) No 1321/2014 and Regulation (EU) No 965/2012 |
| 10.2 Certifying Staff — Maintenance | Detailed understanding of Part-66. |  |  |  |  |  |
| 10.3 Approved Maintenance Organisations | Detailed understanding of Part-145 and Part-CAO |  |  |  |  |  |
| 10.4 Air operations | General understanding of EU-OPS (  Regulation (EU) No 965/2012 ) |  |  |  |  |  |
| Air Operators Certificates; |
| Operators Responsibilities, in particular regarding continuing airworthiness and maintenance; |
| Aircraft Maintenance Programme |
| MEL//CDL |
| Documents to be carried on board; |
| Aircraft placarding (markings) |
| 10.5 (a) Certification of aircraft, parts and appliances - General | General understanding of Part 21 and EASA certification specification CS-23, 25, 27, 29. |  |  |  |  |  |
| 10.5 (b) Certification of aircraft, parts and appliances - Documents | Certificate of Airworthiness; restricted certificates of airworthiness and permit to fly |  |  |  |  |  |
| Certificate of Registration; |
| Noise Certificate; |
| Weight Schedule; |
| Radio Station Licence and Approval. |
| 10.6 Continuing airworthiness | Detailed understanding of Part-21 provisions related to continuing airworthiness |  |  |  |  |  |
| Detailed understanding of Part-M. |
| 10.7 (a) Applicable National and International Requirements  for (if not superseded by EU requirements) | Maintenance Programmes, Maintenance checks and inspections; |  |  |  |  |  |
| Airworthiness Directives; |
| Service Bulletins, manufacturers service information; |
| Modifications and repairs; |
| Maintenance documentation: maintenance manuals, structural repair manual, illustrated parts catalogue, etc.; |
| Master Minimum Equipment Lists, Minimum Equipment  List, Dispatch Deviation Lists; |
| 10.7 (b) Applicable National and International Requirements  for (if not superseded by EU requirements) | Continuing airworthiness; |  |  |  |  |  |
| Minimum equipment requirements - Test flights; |
| ETOPS, maintenance and dispatch requirements; |
| All Weather Operations, Category 2/3 operations. |

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| Module 11A : Turbine Aeroplane Aerodynamics, Structues and Systems | |  | Level | | | |
| Sub module | Subject | Syllabus | L1 | L2 | L3 | NE |
| 11.1.1 Theory of flight- Aeroplane aerodynamics and flight controls | Operation and effect of:  roll control: ailerons and spoilers  pitch control: elevators, stabilators, variable incidence stabilisers and canards  yaw control, rudder limiters |  |  |  |  |  |
| Control using elevons, ruddervators |
| High lift devices, slots, slats, flaps, flaperons |
| Drag inducing devices, spoilers, lift dumpers, speed brakes |
| Effects of wing fences, saw tooth leading edges |
| Boundary layer control using, vortex generators, stall wedges or leading edge devices |
| Operation and effect of trim tabs, balance and antibalance (leading) tabs, servo tabs, spring tabs, mass balance, control surface bias, aerodynamic balance panels |
| 11.1.2 Theory of flight- High speed flight | Speed of sound, subsonic flight, transonic flight, supersonic flight |  |  |  |  |  |
| Mach number, critical Mach number, Compressibility buffet, shock wave, Aerodynamic heating, Area rule |
| Factors affecting airflow in engine intakes of high speed aircraft |
| Effects of sweepback on critical Mach number |
| 11.2(a) Airframe structures – general concepts | Airworthiness requirements for structural strength |  |  |  |  |  |
| Structural classification, primary, secondary and tertiary |
| Fail safe, safe life, damage tolerance concepts |
| Zonal and station identification systems |
| Stress, strain, bending, compression, shear, torsion, tension, hoop stress, fatigue |
| Drains and ventilation provisions |
| System installation provisions |
| Lightning strike protection provision |
| Aircraft bonding |
| 11.2(b) Airframe structures – general concepts | Construction methods of: stressed skin fuselage, formers, stringers, longerons, bulkheads, frames, doublers, struts, ties, beams, floor structures, reinforcement, method 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 |
| 11.3.1 Airframe structures – Aeroplanes- Fuselage (ATA 52/53/56) | 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 |
| 11.3.2 Airframe structures – Aeroplanes – Wings (ATA 57) | Construction |  |  |  |  |  |
| Fuel storage |
| Landing gear, Pylon, Control surface, High lift/drag attachments |
| 11.3.3 Airframe structures – Aeroplanes – Stabilisers (ATA 55) | Construction |  |  |  |  |  |
| Control surface attachment |
| 11.3.4 Airframe structures – Aeroplanes- Flight Control Surfaces (ATA 55/57) | Construction and attachment |  |  |  |  |  |
| Balancing – mass and aerodynamic |
| 11.3.5 Airframe structures – Aeroplanes – Nacelles/Pylons (ATA 54) | Construction |  |  |  |  |  |
| Firewalls |
| Engine mounts |
| 11.4.1 Air conditioning and cabin pressurisation (ATA 21) – Air supply | Sources of air supply including engine bleed, APU, ground cart |  |  |  |  |  |
| 11.4.2 Air conditioning and cabin pressurisation (ATA 21) – Air Conditioning | Air conditioning systems; |  |  |  |  |  |
| Air cycle and Vapour cycle machines ; |
| Distribution systems; |
| Flow, temperature and humidity control system |
| 11.4.3 Air conditioning and cabin pressurisation (ATA 21) - Pressurisation | Pressurisation systems; |  |  |  |  |  |
| Control and indication including control and safety valves; |
| Cabin pressure controllers |
| 11.4.4 Air conditioning and cabin pressurisation (ATA 21) – Safety and warning devices | Protection devices and Warning devices |  |  |  |  |  |
| 11.5.1 Instruments/Avionic systems – Instrument Systems (ATA 31) | Pitot static: altimeter, air speed indicator, vertical speed indicator |  |  |  |  |  |
| Gyroscopic: artificial horizon, attitude director, direction indicator, horizontal situation indicator, turn and slip indicator, turn co-ordinator; |
| Compasses: direct reading, remote reading |
| Angle of attack indication, Stall warning systems |
| Glass Cockpit |
| Other aircraft system indication |
| 11.5.2 Instruments/Avionic systems – Avionic Systems | Fundamentals of system lay-outs and operation of: Auto Flight (ATA 22) |  |  |  |  |  |
| Fundamentals of system lay-outs and operation of: Communications (ATA 23) |
| Fundamentals of system lay-outs and operation of: Navigation Systems (ATA 34) |
| 11.6 Electrical power (ATA 24) | Batteries Installation and Operation |  |  |  |  |  |
| DC power generation |
| AC power generation |
| Emergency power generation |
| Voltage regulation |
| Power distribution |
| Inverters, transformers, rectifiers |
| Circuit protection |
| External/Ground power |
| 11.7(a) Equipment and furnishing (ATA 25) | Emergency equipment requirements |  |  |  |  |  |
| Seats, harnesses and belts |
| 11.7(b) Equipment and furnishing (ATA 25) | Cabin lay-out |  |  |  |  |  |
| Equipment lay-out |
| Cabin Furnishing Installation |
| Cabin entertainment equipment |
| Galley installation |
| Cargo handling and retention equipment |
| Airstairs |
| 11.8(a) Fire protection (ATA 26) | Fire and smoke detection and warning systems; |  |  |  |  |  |
| Fire extinguishing systems; |
| System tests; |
| 11.8(b) Fire protection (ATA 26) | Portable fire extinguisher |  |  |  |  |  |
| 11.9 Flight controls (ATA 27) | Primary controls: aileron, elevator, rudder, spoiler |  |  |  |  |  |
| Trim control |
| Active load control |
| High lift devices |
| Lift dump, Speed brakes |
| System operation: manual, hydraulic, pneumatic, electrical, fly-by-wire |
| Artificial feel Yaw damper Mach trim Rudder limiter Gust locks systems |
| Balancing and Rigging |
| Stall protection/warning system |
| 11.10 Fuel systems (ATA 28) | System lay-out |  |  |  |  |  |
| Fuel tanks |
| Supply systems |
| Dumping, venting and draining |
| Cross-feed and Transfer |
| Indications and Warnings |
| Refuelling and defuelling |
| Longitudinal balance fuel systems |
| 11.11 Hydraulic Power (ATA 29) | System lay-out |  |  |  |  |  |
| Hydraulic fluids |
| Hydraulic reservoirs and accumulators |
| Pressure generation: electric, mechanical, pneumatic |
| Emergency pressure generation |
| Filters |
| Pressure Control |
| Power distribution |
| Indication and warning systems |
| Interface with other systems |
| 11.12 Ice and rain protection (ATA 30) | Ice formation, classification and detection |  |  |  |  |  |
| Anti-icing systems: electrical, hot air and chemical |
| De-icing systems: electrical, hot air, pneumatic and chemical |
| Rain repellent |
| Probe and drain heating |
| Wiper systems |
| 11.13 Landing gear (ATA 32) | Construction, shock absorbing |  |  |  |  |  |
| Extension and retraction systems: normal and emergency |
| Indications and warnings |
| Wheels, brakes, antiskid and autobraking |
| Tyres |
| Steering |
| Air-ground sensing |
| 11.14 Lights (ATA 31) | External: navigation, anti-collision, landing, taxiing, ice |  |  |  |  |  |
| Internal: cabin, cockpit, cargo |
| Emergency |
| 11.15 Oxygen (ATA 35) | System lay-out: cockpit, cabin; |  |  |  |  |  |
| Sources, storage, charging and distribution |
| Supply regulation |
| Indications and warning |
| 11.16 Pneumatic/vacuum (ATA 36) | System lay-out |  |  |  |  |  |
| Sources: engine / APU, compressors, reservoirs, ground supply ; |
| Pressure and vacuum pumps |
| Pressure control; |
| Distribution; |
| Indications and warnings; |
| Interfaces with other systems |
| 11.17 Water/waste (ATA 38) | Water system lay-out, supply, distribution, servicing and draining; |  |  |  |  |  |
| Toilet system lay-out, flushing and servicing; |
| Corrosion aspects. |
| 11.18 On board maintenance systems (ATA 45) | Central maintenance computers; |  |  |  |  |  |
| Data loading system; |
| Electronic library system; |
| Printing; |
| Structure monitoring (damage tolerance monitoring). |
| 11.19 Integrated Modular Avionics (ATA42) | Functions that may be typically integrated in the Integrated Modular Avionic (IMA) modules are, among others:  Bleed Management, Air Pressure Control, Air Ventilation and Control, Avionics and Cockpit Ventilation Control, Temperature Control, Air Traffic Communication, Avionics Communication Router, Electrical Load Management, Circuit Breaker Monitoring, Electrical System BITE, Fuel Management, Braking Control, Steering Control, Landing Gear Extension and Retraction, Tyre Pressure Indication, Oleo Pressure Indication, Brake Temperature Monitoring, etc. |  |  |  |  |  |
| Core System; Network Components. |
| 11.20 Cabin Systems (ATA44) | The units and components which furnish a means of entertaining the passengers and providing communication within the aircraft (Cabin Intercommunication Data System) and between the aircraft cabin and ground stations (Cabin Network Service). Includes voice, data, music and video transmissions |  |  |  |  |  |
| The Cabin Intercommunication Data System provides an interface between cockpit/cabin crew and cabin systems. These systems support data exchange of the different related LRU’s and they are typically operated via Flight Attendant Panels. |
| The Cabin Network Service typically consists on a server, typically interfacing with, among others, the following systems:  — Data/Radio Communication; |
| — Cabin Core System (CCS); |
| — In-flight Entertainment System (IFES); |
| — External Communication System (ECS); |
| — Cabin Mass Memory System (CMMS); |
| — Cabin Monitoring System (CMS); |
| — Miscellaneous Cabin Systems (MCSs). |
| CNS may host functions such as: |
| — access to pre-Departure/ departure reports; |
| — e-mail/intranet/internet access; passenger database |
| 11.21 Information Systems (ATA46) | The units and components which furnish a means of storing, updating and retrieving digital information traditionally provided on paper, microfilm or microfiche. Includes units that are dedicated to the information storage and retrieval function such as the electronic library mass storage and controller. Does not include units or components installed for other uses and  shared with other systems, such as flight deck printer or general use display. |  |  |  |  |  |
| Typical examples include Air Traffic and Information Management Systems and Network Server Systems |
| Aircraft General Information System |
| Flight Deck Information System |
| Maintenance Information System |
| Passenger Cabin Information System |
| Miscellaneous Information System |

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| Module 11B : Piston Aeroplane Aerodynamics, Structure and Systems | |  | Level | | | |
| Sub module | Subject | Syllabus | L1 | L2 | L3 | NE |
| 11.1.1 Theory of Flight - Aeroplane Aerodynamics and Flight Controls | Operation and effect of:  roll control: ailerons and spoilers  pitch control: elevators, stabilators, variable incidence stabilisers and canards  yaw control, rudder limiters |  |  |  |  |  |
| Control using elevons, ruddervators |
| High lift devices, slots, slats, flaps, flaperons |
| Drag inducing devices, spoilers, lift dumpers, speed brakes |
| Effects of wing fences, saw tooth leading edges |
| Boundary layer control using, vortex generators, stall wedges or leading edge devices |
| Operation and effect of trim tabs, balance and antibalance (leading) tabs, servo tabs, spring tabs, mass balance, control surface bias, aerodynamic balance panels |
| 11.1.2 Theory of Flight- High speed flight | N/A | | | | | |
| 11.2(a) Airframe structures – general concepts | Airworthiness requirements for structural strength; |  |  |  |  |  |
| Structural classification, primary, secondary and tertiary; |
| Fail safe, safe life, damage tolerance concepts; |
| Zonal and station identification systems; |
| Stress, strain, bending, compression, shear, torsion, tension, hoop stress, fatigue; |
| Drains and ventilation provisions; |
| System installation provisions; |
| Lightning strike protection provision; |
| Aircraft bonding. |
| 11.2(b) Airframe structures – general concepts | 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 |
| 11.3.1 Airframe structures – Aeroplanes – Fuselage (ATA 52/53/56) | Construction and pressurisation sealing; |  |  |  |  |  |
| Wing, tail-plane, pylon and undercarriage attachments; |
| Seat installation; |
| Doors and emergency exits: construction and operation; |
| Windows and windscreen attachment. |
| 11.3.2 Airframe structures – Aeroplanes – Wings (ATA 57) | Construction |  |  |  |  |  |
| Fuel storage |
| Landing gear, Pylon, Control surface, High lift/drag attachments |
| 11.3.3 Airframe structures – Aeroplanes – Stabilisers (ATA 55) | Construction |  |  |  |  |  |
| Control surface attachment |
| 11.3.4 Airframe structures – Aeroplanes – Flight Control Surfaces (ATA 55/57) | Construction and attachment; |  |  |  |  |  |
| Balancing – mass and aerodynamic |
| 11.3.5 Airframe structures – Aeroplanes – Nacelles/Pylons (ATA 54) | Construction |  |  |  |  |  |
| Firewalls |
| Engine mounts |
| 11.4 Air Conditioning and Cabin Pressurisation (ATA 21) | Pressurisation and air conditioning systems; |  |  |  |  |  |
| Cabin pressure controllers, protection devices and warning devices; |
| Heating systems. |
| 11.5.1 Instruments/Avionic systems – Instrument Systems (ATA 31) | Pitot static: altimeter, air speed indicator, vertical speed indicator; |  |  |  |  |  |
| Gyroscopic: artificial horizon, attitude director, direction indicator, horizontal situation indicator, turn and slip indicator, turn coordinator; |
| Compasses: direct reading, remote reading; |
| Angle of attack indication, stall warning systems; |
| Glass cockpit; |
| Other aircraft system indication. |
| 11.5.2 Instruments/Avionic systems – Avionic Systems | Fundamentals of system lay-outs and operation of:   * Auto Flight (ATA 22), * Communications (ATA 23), * Navigation Systems (ATA 34). |  |  |  |  |  |
| 11.6 Electrical Power (ATA 24) | Batteries Installation and Operation; |  |  |  |  |  |
| DC power generation; |
| Voltage regulation; |
| Power distribution; |
| Circuit protection; |
| Inverters, transformers. |
| 11.7(a) Equipment and furnishing (ATA 25) | Emergency equipment requirements; |  |  |  |  |  |
| Seats, harnesses and belts; |
| 11.7(b) Equipment and furnishing (ATA 25) | Cabin lay-out; |  |  |  |  |  |
| Equipment lay-out; |
| Cabin Furnishing installation; |
| Cabin entertainment equipment; |
| Galley installation; |
| Cargo handling and retention equipment; |
| Airstairs. |
| 11.8(a) Fire Protection (ATA 26) | Fire and smoke detection and warning systems; |  |  |  |  |  |
| Fire extinguishing systems; |
| System tests; |
| 11.8(b) Fire protection (ATA 26) | Portable fire extinguisher |  |  |  |  |  |
| 11.9 Flight controls (ATA 27) | Primary controls: aileron, elevator, rudder; |  |  |  |  |  |
| Trim tabs; |
| High lift devices; |
| System operation: manual; |
| Gust locks; |
| Balancing and Rigging; |
| Stall warning system. |
| 11.10 Fuel systems (ATA 28) | System lay-out; |  |  |  |  |  |
| Fuel tanks; |
| Supply systems; |
| Cross-feed and Transfer; |
| Indications and Warnings; |
| Refuelling and defuelling. |
| 11.11 Hydraulic systems (ATA 29) | System lay-out; |  |  |  |  |  |
| 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 (ATA 30) | Ice formation, classification and detection; |  |  |  |  |  |
| De-icing systems: electrical, hot air, pneumatic and chemical; |
| Probe and drain heating; |
| Wiper systems |
| 11.13 Landing gear (ATA 32) | Construction, shock absorbing; |  |  |  |  |  |
| Extension and retraction systems: normal and emergency; |
| Indications and warnings; |
| Wheels, brakes, antiskid and autobraking; |
| Tyres; |
| Steering; |
| Air-ground sensing. |
| 11.14 Lights (ATA 33) | External: navigation, anti-collision, landing, taxiing, ice; |  |  |  |  |  |
| Internal: cabin, cockpit, cargo; |
| Emergency. |
| 11.15 Oxygen (ATA 35) | System lay-out: cockpit, cabin; |  |  |  |  |  |
| Sources, storage, charging and distribution; |
| Supply regulation; |
| Indications and warnings. |
| 11.16 Pneumatic/vacuum (ATA 36) | System lay-out; |  |  |  |  |  |
| Sources: engine /APU, compressors, reservoirs, ground supply; |
| Pressure and vacuum pumps |
| Pressure control; |
| Distribution; |
| Indications and warnings; |
| Interfaces with other systems. |
| 11.17 Water/waste (ATA 38) | Water system lay-out, supply, distribution, servicing and draining; |  |  |  |  |  |
| Toilet system lay-out, flushing and servicing; |
| Corrosion aspects. |

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| Module 11C: Piston Aeroplane Aerodynamics, Structure and Systems | |  | Level | | | | |
| Sub module | Subject | Syllabus | L1 | L2 | L3 | NE | |
| 11.1 Theory of Flight .Aeroplane aerodynamics and flight controls | Operation and effect of:  roll control: ailerons and spoilers  pitch control: elevators, stabilators, variable incidence stabilisers and canards  yaw control, rudder limiters |  |  |  |  |  | |
| Control using elevons, ruddervators |
| High lift devices, slots, slats, flaps, flaperons |
| Drag inducing devices, spoilers, lift dumpers, speed brakes |
| Effects of wing fences, saw tooth leading edges |
| Boundary layer control using, vortex generators, stall wedges or leading edge devices |
| Operation and effect of trim tabs, balance and antibalance (leading) tabs, servo tabs, spring tabs, mass balance, control surface bias, aerodynamic balance panels |
| 11.2(a) Airframe structures – general concepts | Airworthiness requirements for structural strength |  |  |  |  | |  |
| Structural classification, primary, secondary and tertiary |
| Fail safe, safe life, damage tolerance concepts |
| Zonal and station identification systems |
| Stress, strain, bending, compression, shear, torsion, tension, hoop stress, fatigue |
| Drains and ventilation provisions |
| System installation provisions |
| Lightning strike protection provision |
| Aircraft bonding |
| 11.2(b) Airframe structures – general concepts | 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: chromating, anodising, painting |
| Surface cleaning |
| Airframe symmetry: methods of alignment and symmetry checks |
| 11.3.1 Airframe structures – Aeroplanes – Fuselage (ATA 52/53/56) | Construction |  |  |  |  | |  |
| Wing, tail-plane pylon and undercarriage attachments |
| Seat installation |
| Doors and emergency exits: construction and operation |
| Windows and windscreen attachment |
| 11.3.2 Airframe structures – Aeroplanes – Wings (ATA 57) | Construction |  |  |  |  | |  |
| Fuel storage |
| Landing gear, Pylon, Control surface, High lift/drag attachments |
| 11.3.3 Airframe structures – Aeroplanes- Stabilisers (ATA55) | Construction |  |  |  |  | |  |
| Control surface attachment |
| 11.3.4 Airframe structures – Aeroplanes – Flight Control surfaces (ATA 55/57) | Construction |  |  |  |  | |  |
| Attachment |
| Balancing – mass and aerodynamic |
| 11.3.5 Airframe structures – Aeroplanes – Nacelles / Pylons (ATA 54) | Construction |  |  |  |  | |  |
| Firewalls |
| Engine mounts |
| 11.4 Air conditioning (ATA 21) | Heating and ventilation systems |  |  |  |  | |  |
| 11.5.1 Instruments/Avionic systems – Instrument Systems (ATA 31) | Pitot static: altimeter, air speed indicator, vertical speed indicator |  |  |  |  | |  |
| Gyroscopic: artificial horizon, attitude director, direction indicator, horizontal situation indicator, turn and slip indicator, turn coordinator |
| Compasses: direct reading, remote reading |
| Angle of attack indication, Stall warning systems |
| Glass cockpit |
| Other aircraft system indication |
| 11.5.2 Instruments/Avionic systems – Avionic Systems | Fundamentals of system lay-outs and operation of: Auto Flight (ATA 22) |  |  |  |  | |  |
| Fundamentals of system lay-outs and operation of: Communications (ATA 23) |
| Fundamentals of system lay-outs and operation of: Navigation Systems (ATA 34) |
| 11.6 Electrical power | Batteries Installation and Operation |  |  |  |  | |  |
| DC power generation |
| Voltage regulation |
| Power distribution |
| Circuit protection |
| Inverters, transformers |
| 11.7 Equipment and furnishing (ATA 25) | Emergency equipment requirements |  |  |  |  | |  |
| Seats, harnesses and belts |
| 11.8 Fire protection (ATA 26) | Portable fire extinguisher |  |  |  |  | |  |
| 11.9 Flight controls (ATA 27) | Primary controls: aileron, elevator, rudder |  |  |  |  | |  |
| Trim tabs |
| High lift devices |
| System operation: manual |
| Gust locks |
| Balancing and Rigging |
| Stall warning system |
| 11.10 Fuel systems (ATA 28) | System lay-out |  |  |  |  | |  |
| Fuel tanks |
| Supply systems |
| Cross-feed and Transfer |
| Indications and Warnings |
| Refuelling and defuelling |
| 11.11 Hydraulic systems (ATA 29) | System lay-out |  |  |  |  | |  |
| 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 (ATA 30) | Ice formation, classification and detection |  |  |  |  | |  |
| De-icing systems: electrical, hot air, pneumatic and chemical |
| Probe and drain heating |
| Wiper systems |
| 11.13 Landing gear (ATA 32) | Construction, shock absorbing |  |  |  |  | |  |
| Extension and retraction systems: normal and emergency |
| Indications and warning |
| Wheels, brakes, antiskid and autobraking |
| Tyres |
| Steering |
| 11.14 Lights (ATA 33) | External: navigation, anti-collision, landing, taxiing, ice |  |  |  |  | |  |
| Internal: cabin, cockpit, cargo |
| Emergency |
| 11.15 Oxygen (ATA 35) | System lay-out: cockpit, cabin |  |  |  |  | |  |
| Sources, storage, charging and distribution |
| Supply regulation |
| Indications and warnings |
| 11.16 Pneumatic/vacuum (ATA 36) | System lay-out |  |  |  |  | |  |
| Sources: engine / APU, compressors, reservoirs, ground supply |
| Pressure and vacuum pumps |
| Pressure control, |
| Distribution |
| Indication and warnings |
| Interfaces with other systems |

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| Module 12: Helicopter Aerodynamics, Structure and Systems | |  | Level | | | |
| Sub module | Subject | Syllabus | L1 | L2 | L3 | NE |
| 12.1 Theory of flight – rotary wing aerodynamics | Terminology |  |  |  |  |  |
| Effects of gyroscopic precession |
| Torque reaction and directional control |
| Dissymmetry of lift, Blade tip stall; |
| Translating tendency and its correction |
| Coriolis effect and compensation |
| Vortex ring state, power settling, overpitching |
| Auto-rotation |
| Ground effect |
| 12.2 Flight control systems | Cyclic control |  |  |  |  |  |
| Collective control |
| Swashplate |
| Yaw control: Anti-Torque Control, Tail rotor, bleed air |
| Main Rotor Head: Design and Operation features |
| Blade Dampers: Function and construction |
| Rotor Blades: Main and tail rotor blade construction and attachment |
| Trim control, Fixed and adjustable stabilisers |
| System operation: manual, hydraulic, electrical and fly-by-wire |
| Artificial feel |
| Balancing and rigging |
| 12.3 Blade Tracking and Vibration Analysis | Rotor alignment |  |  |  |  |  |
| Main and tail rotor tracking |
| Static and Dynamic balancing |
| Vibration types, Vibration reduction methods |
| Ground resonance |
| 12.4 Transmission | Gear boxes, main and tail rotors |  |  |  |  |  |
| Clutches, free wheel units and rotor brake |
| Tail rotor drive shafts, flexible couplings, bearings, vibration dampers and bearing hangers |
| 12.5(a) Airframe structures | Airworthiness requirements for structural strength |  |  |  |  |  |
| Structural classification, primary, secondary and tertiary |
| Fail safe, safe life, damage tolerance concepts |
| Zonal and station identification systems |
| Stress, strain, bending, compression, shear, torsion, tension, hoop stress, fatigue |
| Drains and ventilation provisions |
| System installation provisions |
| Lightning strike protection provision |
| 12.5(b) Airframe structures | Construction methods of: stressed skin fuselage, formers, stringers, longerons, bulkheads, frames, doublers, struts, ties, beams, floor structures, reinforcement, methods of skinning and anti-corrosive protection |  |  |  |  |  |
| Pylon, stabiliser and undercarriage attachments |
| Seat installation |
| Doors: construction, mechanisms, operation and safety devices |
| Windows and windscreen construction |
| Fuel storage |
| Firewalls |
| Engine mounts |
| 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 |
| 12.6.1 Air conditioning (ATA 21)- Air supply | Sources of air supply including engine bleed and ground cart |  |  |  |  |  |
| 12.6.2 Air conditioning (ATA 21) Air conditioning | Air conditioning systems |  |  |  |  |  |
| Distribution systems |
| Flow and temperature control systems |
| Protection and warning devices |
| 12.7.1 Instruments/avionic systems – Instrument systems (ATA 31) | Pitot static: altimeter, air speed indicator, vertical speed indicator |  |  |  |  |  |
| Gyroscopic: artificial horizon, attitude director, direction indicator, horizontal situation indicator, turn and slip indicator, turn co-ordinator |
| Compasses: direct reading, remote reading |
| Vibration indicating systems – HUMS |
| Glass cockpit |
| Other aircraft system indication |
| 12.7.2 Instruments/avionic systems – Avionic systems | Fundamentals of system layouts and operation of: Auto Flight (ATA 22) |  |  |  |  |  |
| Fundamentals of system layouts and operation of: Communications (ATA 23) |
| Fundamentals of system layouts and operation of: Navigation Systems (ATA 34) |
| 12.8 Electrical power (ATA 24) | Batteries Installation and Operation |  |  |  |  |  |
| DC power generation, AC power generation |
| Emergency power generation |
| Voltage regulation, Circuit protection |
| Power distribution |
| Inverters, transformers, rectifiers |
| External/Ground power |
| 12.9(a) Equipment and furnishing (ATA 25) | Emergency equipment requirements |  |  |  |  |  |
| Seats, harnesses and belts |
| Lifting systems |
| 12.9(b) Equipment and furnishing (ATA 25) | Emergency flotation systems |  |  |  |  |  |
| Cabin lay-out, Cargo retention |
| Equipment lay-out |
| Cabin Furnishing Installation |
| 12.10 Fire protection (ATA 26) | Fire and smoke detection and warning systems |  |  |  |  |  |
| Fire extinguishing systems |
| System tests |
| 12.11 Fuel systems (ATA 28) | System lay-out |  |  |  |  |  |
| Fuel tanks |
| Supply systems |
| Dumping, venting and draining |
| Cross-feed and transfer |
| Indications and warnings |
| Refuelling and defuelling |
| 12.12 Hydraulic power (ATA 29) | System lay-out |  |  |  |  |  |
| Hydraulic fluids |
| Hydraulic reservoirs and accumulators |
| Pressure generation: electric, mechanical, pneumatic |
| Emergency pressure generation |
| Filters |
| Pressure Control |
| Power distribution |
| Indication and warning systems |
| Interface with other systems |
| 12.13 Ice and rain protection (ATA 30) | Ice formation, classification and detection |  |  |  |  |  |
| Anti-icing and De- icing systems: electrical, hot air and chemical |
| Rain repellant and removal |
| Probe and drain heating |
| Wiper system |
| 12.14 Landing gear (ATA 32) | Construction, shock absorbing |  |  |  |  |  |
| Extension and retraction systems: normal and emergency |
| Indications and warnings |
| Wheels, Tyres, brakes |
| Steering |
| Air ground sensing |
| Skids, floats |
| 12.15 Lights (ATA 33) | External: navigation, landing, taxiing, ice |  |  |  |  |  |
| Internal: cabin, cockpit, cargo |
| Emergency |
| 12.16 Pneumatic/vacuum (ATA 36) | System lay-out |  |  |  |  |  |
| Sources: engine/APU, compressors, reservoirs, ground supply |
| Pressure and vacuum pumps |
| Pressure control |
| Distribution |
| Indications and warnings |
| Interfaces with other systems |
| 12.17 Integrated Modular Avionics (ATA42) | Functions that may be typically integrated in the Integrated Modular Avionic (IMA) modules  are, among others:  Bleed Management, Air Pressure Control, Air Ventilation and Control, Avionics and Cockpit Ventilation Control, Temperature Control, Air Traffic Communication, Avionics Communication Router, Electrical Load Management, Circuit Breaker Monitoring, Electrical System BITE, Fuel Management, Braking Control, Steering Control, Landing Gear Extension and Retraction, Tyre Pressure Indication, Oleo Pressure Indication, Brake Temperature Monitoring, Etc |  |  |  |  |  |
| Core system |
| Network components |
| 12.18 On Board Maintenance Systems (ATA45) | Central maintenance computers; |  |  |  |  |  |
| Data loading system; |
| Electronic library system; |
| Printing; |
| Structure monitoring (damage tolerance monitoring). |
| 12.19 Information Systems (ATA46) | The units and components which furnish a means of storing, updating and retrieving digital information traditionally provided on paper, microfilm or microfiche. Includes units that are dedicated to the information storage and retrieval function such as the electronic library mass storage and controller. Does not include units or components installed for other uses and  shared with other systems, such as flight deck printer or general use display. |  |  |  |  |  |
| Typical examples include Air Traffic and Information Management Systems and Network Server Systems. |
| Aircraft General Information System; |
| Flight Deck Information System; |
| Maintenance Information System; |
| Passenger Cabin Information System; |
| Miscellaneous Information System. |

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| Module 13 : Aircraft Aerodynamics, Structure and Systems | |  | Level | | | |
| Sub module | Subject | Syllabus | L1 | L2 | L3 | NE |
| 13.1(a) theory of flight- Aeroplane Aerodynamics and Flight Controls | Operation and effect of: roll control: ailerons and spoilers |  |  |  |  |  |
| Operation and effect of: pitch control: elevators, stabilators, variable incidence stabilisers and canards |
| Operation and effect of: yaw control, rudder limiters |
| Control using elevons, ruddervators |
| High lift devices: slots, slats, flaps |
| Drag inducing devices: spoilers, lift dumpers, speed brakes |
| Operation and effect of trim tabs, servo tabs, control surface bias |
| 13.1(b) theory of flight – High Speed Flight | Speed of sound, Subsonic flight, transonic flight, supersonic flight |  |  |  |  |  |
| Mach number, critical Mach number |
| 13.1(c) theory of flight – Rotary Wing Aerodynamics | Terminology |  |  |  |  |  |
| Operation and effect of cyclic, collective and anti-torque controls |
| 13.2(a) Structures – general concepts | Fundamentals of structural systems. |  |  |  |  |  |
| 13.2(b) Structures – general concepts | Zonal and station identification systems |  |  |  |  |  |
| Electrical bonding |
| Lightning strike protection provision |
| 13.3 Autoflight (ATA 22) (a) | Fundamentals of automatic flight control including working principles and current terminology  Command signal processing  Modes of operation: roll, pitch and yaw channels  Yaw dampers  Stability Augmentation System in helicopters  Automatic trim control  Autopilot navigation aids interface |  |  |  |  |  |
| 13.3 Autoflight (ATA 22) (b) | Autothrottle systems |  |  |  |  |  |
| Automatic Landing Systems: principles and categories, modes of operation, approach, glideslope, land, go-around, system monitors and failure conditions. |
| 13.4 (a) Communication  Navigation (ATA 23/24) | Fundamentals of radio wave propagation, antennas, transmission lines, communication, receiver and transmitter;  Working principles of following systems:  — Very High Frequency (VHF) communication;  — High Frequency (HF) communication;  — Audio;  — Emergency Locator Transmitters (ELTs);  — Cockpit Voice Recorder (CVR);  — Very High Frequency Omnidirectional Range (VOR);  — Automatic Direction Finding (ADF);  — Instrument Landing System (ILS);  — Flight Director Systems (FDSs), Distance Measuring Equipment (DME);  — Area navigation, RNAV systems;  — Flight Management Systems (FMSs);  — Global Positioning System (GPS), Global Navigation Satellite Systems (GNSSs);  — Data Link. |  |  |  |  |  |
| 13.4 (b) Communication  Navigation (ATA 23/24) | — Air Traffic Control transponder, secondary surveillance radar;  — Traffic Alert and Collision Avoidance System (TCAS);  — Weather avoidance radar;  — Radio altimeter;  — Automatic Dependent Surveillance  — Broadcast (ADS-B). |  |  |  |  |  |
| 13.4 (c) Communication  Navigation (ATA 23/24) | — Microwave Landing System (MLS);  — Very Low Frequency and hyperbolic navigation (VLF/Omega);  — Doppler navigation;  — Inertial Navigation System (INS);  — ARINC (Aircraft Radio Incorporated) communication and reporting. |  |  |  |  |  |
| 13.5 Electrical power (ATA 24) | Batteries Installation and Operation |  |  |  |  |  |
| DC power generation |
| AC power generation |
| Emergency power generation |
| Voltage regulation |
| Power distribution |
| Inverters, transformers, rectifiers |
| Circuit protection |
| External/Ground power |
| 13.6 Equipment and furnishing (ATA 25) | Electronic emergency equipment requirements |  |  |  |  |  |
| Cabin entertainment equipment |
| 13.7(a) Flight controls (ATA 27) | Primary controls: aileron, elevator, rudder, spoiler |  |  |  |  |  |
| Trim control |
| Active load control |
| High lift devices |
| Lift dump, Speed brakes |
| System operation: manual, hydraulic, pneumatic |
| Artificial feel, Yaw damper, Mach trim, Rudder limiter, Gust locks |
| Stall protection systems |
| 13.7(b) Flight controls (ATA 27) | System operation: electrical, fly by wire |  |  |  |  |  |
| 13.8 Instruments (ATA 31) | Classification |  |  |  |  |  |
| Atmosphere |
| Terminology |
| Pressure measuring devices and systems |
| Pitot static systems |
| Altimeters |
| Vertical speed indicators |
| Airspeed indicators |
| Machmeters |
| Altitude reporting / alerting systems |
| Air data computers |
| Instrument pneumatic systems |
| Direct reading pressure gauges and temperature gauges |
| Temperature indicating systems |
| Fuel quantity indicating systems |
| Gyroscopic principles |
| Artificial horizons |
| Slip indicators |
| Directional gyros |
| Ground Proximity Warning Systems |
| Compass systems |
| Flight Data Recording systems |
| Electronic Flight Instrument Systems |
| Instrument warning systems: master warning systems and centralised warning panels |
| Stall warning systems and angle of attack indicating systems |
| Vibration measurement and indication |
| Glass cockpit |
| 13.9 Lights (ATA 33) | External: navigation, landing, taxiing, ice |  |  |  |  |  |
| Internal: cabin, cockpit, cargo |
| Emergency |
| 13.10 On board maintenance systems (ATA 45) | Central maintenance computers |  |  |  |  |  |
| Data loading system |
| Electronic library system |
| Printing system |
| Structure monitoring (damage tolerance monitoring) |
| 13.11.1. Air Conditioning and Cabin Pressurisation (ATA21) - Air supply | Sources of air supply including engine bleed, APU and ground cart; |  |  |  |  |  |
| 13.11.2. Air Conditioning and Cabin Pressurisation (ATA21) - Air Conditioning | Air conditioning systems; |  |  |  |  |  |
| Air cycle and vapour cycle machines; |
| Distribution systems; |
| Flow, temperature and humidity control system. |
| 13.11.3. Air Conditioning and Cabin Pressurisation (ATA21) -Pressurisation | Pressurisation systems; |  |  |  |  |  |
| Control and indication including control and safety valves; |
| Cabin pressure controllers. |
| 13.11.4. Air Conditioning and Cabin Pressurisation (ATA21) - Safety and warning devices | Protection and warning devices. |  |  |  |  |  |
| 13.12 (a) Fire Protection (ATA 26) | Fire and smoke detection and warning systems; |  |  |  |  |  |
| Fire extinguishing systems |
| System tests; |
| 13.12 (b) Fire Protection (ATA 26) | Portable fire extinguisher. |  |  |  |  |  |
| 13.13 Fuel Systems (ATA 28) | System lay-out; |  |  |  |  |  |
| Fuel tanks; |
| Supply systems; |
| Dumping, venting and draining; |
| Cross-feed and transfer; |
| Indications and warnings; |
| Refuelling and defuelling; |
| Longitudinal balance fuel systems. |
| 13.14 Hydraulic Power (ATA 29) | System lay-out |  |  |  |  |  |
| Hydraulic fluids; |
| Hydraulic reservoirs and accumulators; |
| Pressure generation: electrical, mechanical, pneumatic; |
| Emergency pressure generation; |
| Filters; |
| Pressure control; |
| Power distribution; |
| Indication and warning systems; |
| Interface with other systems. |
| 13.15 Ice and Rain Protection (ATA 30) | Ice formation, classification and detection |  |  |  |  |  |
| Anti-icing systems: electrical, hot air and chemical; |
| De-icing systems: electrical, hot air, pneumatic, chemical; |
| Rain repellent; |
| Probe and drain heating; |
| Wiper Systems. |
| 13.16 Landing Gear (ATA 32) | Construction, shock absorbing; |  |  |  |  |  |
| Extension and retraction systems: normal and emergency; |
| Indications and warnings; |
| Wheels, brakes, antiskid and autobraking; |
| Tyres; |
| Steering; |
| Air-ground sensing. |
| 13.17 Oxygen (ATA 35) | System lay-out: cockpit, cabin; |  |  |  |  |  |
| Sources, storage, charging and distribution; |
| Supply regulation; |
| Indications and warnings |
| 13.18 Pneumatic/Vacuum (ATA 36) | System lay-out; |  |  |  |  |  |
| Sources: engine/APU, compressors, reservoirs, ground supply; |
| Pressure control; |
| Distribution; |
| Indications and warnings; |
| Interfaces with other systems. |
| 13.19 Water/Waste (ATA 38) | Water system lay-out, supply, distribution, servicing and draining; |  |  |  |  |  |
| Toilet system lay-out, flushing and servicing. |
| 13.20 Integrated Modular Avionics (ATA42) | Functions that may be typically integrated in the Integrated Modular Avionic (IMA) modules are, among others:  Bleed Management, Air Pressure Control, Air Ventilation and Control, Avionics and Cockpit Ventilation Control, Temperature Control, Air Traffic Communication, Avionics Communication Router, Electrical Load Management, Circuit Breaker Monitoring, Electrical System BITE, Fuel Management, Braking Control, Steering Control, Landing Gear Extension and Retraction, Tyre Pressure Indication, Oleo  Pressure Indication, Brake Temperature Monitoring, etc.; |  |  |  |  |  |
| Core System; |
| Network Components. |
| 13.21 Cabin Systems (ATA44) | The units and components which furnish a means of entertaining the passengers and providing communication within the aircraft (Cabin Intercommunication Data System) and between the aircraft cabin and ground stations (Cabin Network Service). Includes voice, data, music and video transmissions. |  |  |  |  |  |
| The Cabin Intercommunication Data System provides an interface between cockpit/cabin crew and cabin systems. These systems support data exchange of the different related LRU’s and they are typically operated via Flight Attendant Panels |
| The Cabin Network Service typically consists on a server, interfacing with, among others, the following systems:  — Data/Radio Communication;  — Cabin Core System (CCS);  — In-flight Entertainment System (IFES);  — External Communication System (ECS);  — Cabin Mass Memory System (CMMS);  — Cabin Monitoring System (CMS);  — Miscellaneous Cabin Systems (MCSs).  CNS may host functions such as:  — access to pre-departure/departure reports;  — e-mail/intranet/internet access;  — passenger database. |
| 13.22 Information Systems (ATA46) | The units and components which furnish a means of storing, updating and retrieving digital information traditionally provided on paper, microfilm or microfiche. Includes units that are dedicated to the information storage and retrieval function such as the electronic library mass storage and controller.  Does not include units or components installed for other uses and shared with other systems, such as flight deck printer or general use display |  |  |  |  |  |
| Typical examples include:  Air Traffic and Information Management Systems and Network Server Systems |
| Aircraft General Information System; |
| Flight Deck Information System; |
| Maintenance Information System; |
| Passenger Cabin Information System; |
| Miscellaneous Information System. |

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| Module 14 : Propulsion | |  | Level | | | |
| Sub module | Subject | Syllabus | L1 | L2 | L3 | NE |
| 14.1(a) Turbine engines | Constructional arrangement and operation of turbojet, turbofan, turboshaft and turbopropeller engines; |  |  |  |  |  |
| 14.1(b) Turbine engines | Electronic Engine control and fuel metering systems (FADEC) |  |  |  |  |  |
| 14.2 Engine indicating systems | Exhaust gas temperature/ Interstage turbine temperature systems |  |  |  |  |  |
| Engine speed |
| Engine Thrust Indication: Engine Pressure Ratio, engine turbine discharge pressure or jet pipe pressure systems |
| Oil pressure and temperature |
| Fuel pressure, temperature and flow |
| Manifold pressure |
| Engine torque |
| Propeller speed |
| 14.3 Starting and Ignition Systems | Operation of engine start systems and components; |  |  |  |  |  |
| Ignition systems and components; |
| Maintenance safety requirements. |

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| Module 15 : Gas Turbine Engine | |  | Level | | | |
| Sub module | Subject | Syllabus | L1 | L2 | L3 | NE |
| 15.1 Fundamentals | Potential energy, kinetic energy, Newton’s laws of motion, Brayton cycle; |  |  |  |  |  |
| The relationship between force, work, power, energy, velocity, acceleration |
| Constructional arrangement and operation of turbojet, turbofan, turboshaft and turboprop |
| 15.2 Engine Performance | 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 |
| 15.3 Inlet | Compressor inlet ducts |  |  |  |  |  |
| Effects of various inlet configurations |
| Ice protection |
| 15.4 Compressors | Axial and centrifugal types |  |  |  |  |  |
| Constructional features and 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 Combustion Section | Constructional features and principles of operation. |  |  |  |  |  |
| 15.6 Turbine Section | 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 Exhaust | Constructional features and principles of operation |  |  |  |  |  |
| Convergent, divergent and variable area nozzles |
| Engine noise reduction |
| Thrust reversers |
| 15.8 Bearings and Seals | Constructional features and principles of operation. |  |  |  |  |  |
| 15.9 Lubricants and Fuels | Properties and specifications |  |  |  |  |  |
| Fuel additives |
| Safety precautions |
| 15.10 Lubrication Systems | System operation/ lay-out and components |  |  |  |  |  |
| 15.11 Fuel Systems | Operation of engine control and fuel metering systems including electronic engine control (FADEC) |  |  |  |  |  |
| Systems lay-out and components |
| 15.12 Air Systems | Operation of engine air distribution and anti - ice control systems, including internal cooling, sealing and external air services |  |  |  |  |  |
| 15.13 Starting and Ignition Systems | Operation of engine start systems and components |  |  |  |  |  |
| Ignition systems and components |
| Maintenance safety requirements |
| 15.14 Engine Indicating Systems | 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 |
| 15.15 Power Augmentation Systems | Operation and applications |  |  |  |  |  |
| Water injection, water methanol |
| Afterburner systems |
| 15.16 Turbo-prop Engines | Gas coupled/free turbine and gear coupled turbines |  |  |  |  |  |
| Reduction gears |
| Integrated engine and propeller controls |
| Overspeed safety devices |
| 15.17 Turbo-shaft Engines | Arrangements, drive systems, reduction gearing, couplings, control systems |  |  |  |  |  |
| 15.18 Auxiliary Power Units (APUs) | Purpose, operation, protective systems |  |  |  |  |  |
| 15.19 Powerplant Installation | 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 |  |  |  |  |  |
| 15.20 Fire Protection Systems | Operation of detection and extinguishing systems |  |  |  |  |  |
| 15.21 Engine Monitoring and Ground Operation | Procedures for starting and ground run-up |  |  |  |  |  |
| Interpretation of engine power output and parameters |
| Trend (including oil analysis, vibration and boroscope) monitoring |
| Inspection of engine and components to criteria, tolerances and data specified by engine manufacturer |
| Compressor washing/cleaning |
| Foreign Object Damage |
| 15.22 Engine Storage and Preservation | Preservation and depreservation for the engine and accessories/systems |  |  |  |  |  |

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| Module 16 : Piston Engine | |  | Level | | | |
| Sub module | Subject | Syllabus | L1 | L2 | L3 | NE |
| 16.1 Fundamentals | Mechanical, thermal and volumetric efficiencies |  |  |  |  |  |
| Operating principle - 2 stroke, 4 stroke, Otto and Diesel |
| Piston displacement and compression ratio |
| Engine configuration and firing order |
| 16.2 Engine Performance | Power calculation and measurement |  |  |  |  |  |
| Factors affecting engine power |
| Mixtures/leaning, pre-ignition |
| 16.3 Engine Construction | Crank case, crank shaft, cam shafts, sumps |  |  |  |  |  |
| Accessory gearbox |
| Cylinder and piston assemblies |
| Connecting rods, inlet and exhaust manifolds |
| Valve mechanisms |
| Propeller reduction gearboxes |
| 16.4.1 Engine Fuel Systems - Carburettors | Types, construction and principles of operation |  |  |  |  |  |
| Icing and heating |
| 16.4.2 Engine Fuel Systems – Fuel injection systems | Types, construction and principles of operation |  |  |  |  |  |
| 16.4.3 Engine Fuel Systems – Electronic engine control | Operation of engine control and fuel metering systems including electronic engine control (FADEC) |  |  |  |  |  |
| Systems lay-out and components |
| 16.5 Starting and Ignition Systems | Starting systems, pre-heat systems |  |  |  |  |  |
| Magneto types, construction and principles of operation |
| Ignition harnesses, spark plugs |
| Low and high tension systems |
| 16.6 Induction, Exhaust and Cooling Systems | Construction and operation of: induction systems including alternate air systems |  |  |  |  |  |
| Exhaust systems, engine cooling systems - air and liquid |
| 16.7 Supercharging/  Turbocharging | Principles and purpose of supercharging and its effects on engine parameters |  |  |  |  |  |
| Construction and operation of supercharging/turbocharging systems |
| System terminology |
| Control systems |
| System protection |
| 16.8 Lubricants and Fuels | Properties and specifications |  |  |  |  |  |
| Fuel additives |
| Safety precautions |
| 16.9 Lubrication systems | System operation/ lay-out and components |  |  |  |  |  |
| 16.10 Engine Indication Systems | Engine speed |  |  |  |  |  |
| Cylinder head temperature |
| Coolant temperature |
| Oil pressure and temperature |
| Exhaust Gas Temperature |
| Fuel pressure and flow |
| Manifold pressure |
| 16.11 Powerplant Installation | 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 | 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 | Preservation and depreservation for the engine and accessories/systems |  |  |  |  |  |

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| Module 17A: Propellers | |  | Level | | | |
| Sub module | Subject | Syllabus | L1 | L2 | L3 | NE |
| 17.1 Fundamentals | 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 |
| 17.2 Propeller Construction | Construction methods an 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/ spinner installation |
| 17.3 Propeller Pitch Control | Speed control and pitch change methods, mechanical and electrical/electronic |  |  |  |  |  |
| Feathering and reverse pitch |
| Overspeed protection |
| 17.4 Propeller Synchronising | Synchronising and synchrophasing equipment |  |  |  |  |  |
| 17.5 Propeller Ice Protection | Fluid and electrical de-icing equipment |  |  |  |  |  |
| 17.6 Propeller Maintenance | Static and dynamic balancing |  |  |  |  |  |
| Blade tracking |
| Assessment of blade damage, erosion, corrosion, impact damage, delamination |
| Propeller treatment / repair schemes |
| Propeller engine running |
| 17.7 Propeller Storage and Preservation | Propeller preservation and de-preservation |  |  |  |  |  |

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| Module 17B: Propellers | |  | Level | | | |
| Sub module | Subject | Syllabus | L1 | L2 | L3 | NE |
| 17.1 Fundamentals | 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 |
| 17.2 Propeller Construction | 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 / spinner installation |
| 17.3 Propeller Pitch Control | Speed control and pitch change methods, mechanical and electrical/electronic |  |  |  |  |  |
| Feathering and reverse pitch |
| Overspeed protection |
| 17.4 Propeller Synchronising | Synchronising and synchrophasing equipment |  |  |  |  |  |
| 17.5 Propeller Ice Protection | Fluid and electrical de-icing equipment |  |  |  |  |  |
| 17.6 Propeller Maintenance | Static and dynamic balancing |  |  |  |  |  |
| Blade tracking |
| Assessment of blade damage, erosion, corrosion, impact damage, delamination |
| Propeller treatment/ repair schemes |
| Propeller engine running |
| 17.7 Propeller Storage and Preservation | Propeller preservation and depreservation |  |  |  |  |  |

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| Module 1L : Basic Knowledge | |  | Level | | | |
| Sub module | Subject | Syllabus | L1 | L2 | L3 | NE |
| 1L.1 Mathematics | Arithmetic  — 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.  Algebra  — Evaluating simple algebraic expressions: addition, subtraction, multiplication and division;  — Use of brackets;  — Simple algebraic fractions.  Geometry  — Simple geometrical constructions;  — Graphical representation: nature and uses of graphs. |  |  |  |  |  |
| 1L2 Physics Matter | — Nature of matter: the chemical elements;  — Chemical compounds;  — States: solid, liquid and gaseous;  — Changes between states.  Mechanics  — Forces, moments and couples, representation as vectors;  — Centre of gravity;  — Tension, compression, shear and torsion;  — Nature and properties of solids, fluids and gases.  Temperature  — Thermometers and temperature scales: Celsius, Fahrenheit and Kelvin;  — Heat definition. |  |  |  |  |  |
| 1L.3 Electrics | DC Circuits  — Ohm's law, Kirchoff's voltage and current laws;  — Significance of the internal resistance of a supply;  — Resistance/resistor;  — Resistor colour code, values and tolerances, preferred values, wattage ratings;  — Resistors in series and parallel. |  |  |  |  |  |
| 1L.4 Aerodynamics/ aerostatics | International Standard Atmosphere (ISA), application to aerodynamics and aerostatics.  Aerodynamics  — Airflow around a body;  — Boundary layer, laminar and turbulent flow;  — Thrust, weight, aerodynamic resultant;  — Generation of lift and drag: angle of attack, polar curve, stall.  Aerostatics  Effect on envelopes, wind effect, altitude and temperature effects. |  |  |  |  |  |
| 1L.5 Workplace safety and environmental protection | — Safe working practices and precautions when working with electricity, gases (especially oxygen), oils and chemicals;  — Labelling, storage and disposal of hazardous (to safety and environment) materials;  — Remedial action in the event of a fire or another accident with one or more hazards, including knowledge of extinguishing agents. |  |  |  |  |  |

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| Module 2L : Human Factors | |  | Level | | | |
| Sub module | Subject | Syllabus | L1 | L2 | L3 | NE |
| 2L.1 General | — The need to take human factors into account;  — Incidents attributable to human factors/human error;  — Murphy's Law. |  |  |  |  |  |
| 2L.2 Human performance and limitations | Vision, hearing, information processing, attention and perception, memory. |  |  |  |  |  |
| 2L.3 Social psychology | Responsibility, motivation, peer pressure, teamwork. |  |  |  |  |  |
| 2L.4 Factors affecting performance | Fitness/health, stress, sleep, fatigue, alcohol, medication, drug abuse. |  |  |  |  |  |
| 2L.5 Physical environment | Working environment (climate, noise, illumination). |  |  |  |  |  |

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| Module 3L : Aviation Legislation | |  | Level | | | |
| Sub module | Subject | Syllabus | L1 | L2 | L3 | NE |
| 3L.1 Regulatory framework | — Role of the European Commission, EASA and National Aviation Authorities (NAAs);  — Applicable parts of Part-M and Part-66. |  |  |  |  |  |
| 3L.2 Repairs and modifications | — Approval of changes (repairs and modifications);  — Standard changes and standard repairs |  |  |  |  |  |
| 3L.3 Maintenance data | — Airworthiness Directives (ADs), Instructions for Continuing Airworthiness (ICA) (AMM, IPC, etc.);  — Flight Manual;  — Maintenance records. |  |  |  |  |  |

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| Module 4L : Airframe Wooden / Metal Tube and Fabric | |  | Level | | | |
| Sub module | Subject | Syllabus | L1 | L2 | L3 | NE |
| 4L.1 Airframe wooden/ combination of metal tube and fabric | — Timber, plywood, adhesives, preservation, power line, properties, machining;  — Covering (covering materials, adhesives and finishes, natural and synthetic covering materials and adhesives);  — Paint, assembly and repair processes;  — Recognition of damages from overstressing of wooden/metal-tube and fabric structures;  — Deterioration of wood components and coverings;  — Crack test (optical procedure, e.g., magnifying glass) of metal components. Corrosion and preventive methods. Health and fire safety protections. |  |  |  |  |  |
| 4L.2 Material | — Types of wood, stability, and machining properties;  — Steel and light alloy tubes and fittings, fracture inspections of welded seams;  — Plastics (overview, understanding of the properties);  — Paints and paint removal;  — Glues, adhesives;  — Covering materials and technologies (natural and synthetic polymers). |  |  |  |  |  |
| 4L.3 Identifying damage | — Overstress of wood / metal-tubing and fabric structures;  — Load transfers;  — Fatigue strength and crack testing. |  |  |  |  |  |
| 4L.4 Performance of practical activities | — Locking of pins, screws, castellated nuts, turnbuckles;  — Thimble splice;  — Nicopress and Talurit repairs;  — Repair of coverings;  — Repair of transparencies;  — Repair exercises (plywood, stringer, handrails, skins);  — Aircraft Rigging. Calculation of control surface mass balance and range of movement of the control surfaces, measurement of operating forces;  — Performance of 100-hours/annual inspections on a wood or combination of metal-tube and fabric airframe. |  |  |  |  |  |

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| Module 5L : Airframe Composite | |  | Level | | | |
| Sub module | Subject | Syllabus | L1 | L2 | L3 | NE |
| 5L.1 Airframe fibre-reinforced plastic (FRP) | — Basic principles of FRP construction;  — Resins (Epoxy, polyester, phenolic resins, vinyl ester resins);  — Reinforcement materials glass, aramide and carbon fibres, features;  — Fillers;  — Supporting cores (balsa, honeycombs, foamed plastics);  — Constructions, load transfers (solid FRP shell, sandwiches);  — Identification of damage during overstressing of components;  — Procedure for FRP projects (according to Maintenance Organisation Manual) including storage conditions for material. |  |  |  |  |  |
| 5L.2 Material | — Thermosetting plastics, thermoplastic polymers, catalysts;  — Understanding properties, machining technologies, detaching, bonding, welding;  — Resins for FRP: epoxy resins, polyester resins, vinyl ester resins, phenolic resins;  — Reinforcement materials;  — From elementary fibre to filaments (release agent, finish), weaving patterns;  — Properties of individual reinforcement materials (E-glass fibre, aramide fibre, carbon fibre); — Problem with multiple-material systems, matrix;  — Adhesion/cohesion, various behaviours of fibre materials;  — Filling materials and pigments;  — Technical requirements for filling materials;  — Property change of the resin composition through the use of E-glass, micro balloon, aerosols, cotton, minerals, metal powder, organic substances;  — Paint assembly and repair technologies;  — Support materials;  — Honeycombs (paper, FRP, metal), balsa wood, Divinycell (Contizell), development trends. |  |  |  |  |  |
| 5L.3 Assembly of Fibre-Reinforced Composite-Structure Airframes | — Solid shell;  — Sandwiches;  — Assembly of aerofoils, fuselages, control surfaces. |  |  |  |  |  |
| 5L.4 Identifying Damage | — Behaviour of FRP components in the event of overstressing;  — Identifying delaminations, loose bonds;  — Bending vibration frequency in aerofoils;  — Load transfer;  — Frictional connection and positive locking;  — Fatigue strength and corrosion of metal parts;  — Metal bonding, surface finishing of steel and aluminium components during bonding with FRP. |  |  |  |  |  |
| 5L.5 Mold making | — Plaster molds, mold ceramics;  — GFK molds, Gel-coat, reinforcement materials, rigidity problems;  — Metal molds;  — Male and female molds. |  |  |  |  |  |
| 5L.6 Performance of practical activities | — Locking of pin, screws, castellated nuts, turnbuckles;  — Thimble splice;  — Nicopress and Talurit repairs;  — Repair of coverings;  — Repair of solid FRP shells;  — Mold fabrication/molding of a component (e.g. fuselage nose, landing gear fairing, wing tip and winglet);  — Repair of sandwich shell where interior and exterior layer are damaged;  — Repair of sandwich shell by pressing with a vacuum bag;  — Transparency repair (PMMA) with one- and two-component adhesive;  — Bonding of transparency with the canopy frame;  — Tempering of transparencies and other components;  — Performance of a repair on a sandwich shell (minor repair less than 20 cm);  — Aircraft Rigging. Calculation of control surface mass balance and range of movement of the control surfaces, measurement of operating forces;  — Performance of 100-hour/annual inspections on an FRP airframe. |  |  |  |  |  |

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| Module 6L : Airframe Metal | | |  | Level | | | |
| Sub module | Subject | | Syllabus | L1 | L2 | L3 | NE |
| 6L.1 Airframe metal | — Metallic materials and semi-finished products, machining methods;  — Fatigue strength and crack test;  — Assembly of metal-construction components, riveted joints, adhesive joints;  — Identification of damage to overstressed components, effects of corrosion;  — Health and fire protection. | |  |  |  |  |  |
| 6L.2 Material | — Steel and its alloys;  — Light metals and their light alloys;  — Rivet materials;  — Plastics;  — Colours and paints;  — Metal adhesives;  — Types of corrosion;  — Covering materials and technologies (natural and synthetic). | |  |  |  |  |  |
| 6L.3 Identifying damage | — Overstressed metal airframes, levelling, measurement of symmetry;  — Load transfers;  — Fatigue strength and crack test;  — Identifying loose riveted joints. | |  |  |  |  |  |
| 6L.4 Assembly of metal- and composite-construction airframes | — Skins;  — Frames;  — Stringers and longerons;  — Frame construction;  — Problems in multiple-material systems. | |  |  |  |  |  |
| 6L.5 Fasteners | — Classifications of fits and clearances;  — Metric and imperial measuring systems;  — Oversize bolt. | |  |  |  |  |  |
| 6L.6 Performance of practical activities | — Locking of pins, screws, castellated nuts, turnbuckles;  — Thimble splice;  — Nicopress and Talurit repairs;  — Repair of coverings, surface damage, stop drilling techniques;  — Repair of transparencies;  — Cutting out sheet metals (aluminiums and light alloys, steel and alloys);  — Folding bending, edging, beating, smoothening, beading;  — Repair riveting of metal airframes according to repair instruction or drawings;  — Evaluation of rivet errors;  — Aircraft Rigging. Calculation of control surface mass balance and range of movement of the control surfaces, measurement of operating forces;  — Performance of 100-hour/annual inspections on a metal airframe. |  | |  |  |  |  |

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| Module 7L : Airframe General | |  | Level | | | |
| Sub module | Subject | Syllabus | L1 | L2 | L3 | NE |
| 7L.1 Flight control system | — Cockpit controls: controls in cockpit, colour markings, knob shapes;  — Flight controls surfaces, flaps, air brakes surfaces, controls, hinges, bearings, brackets, push-pull rods, bell cranks, horns, pulleys, cables, chains, tubes, rollers, tracks, jack screws, surfaces, movements, lubrication, stabilisers, balancing of controls;  — Combination of controls: flap ailerons, flap air brakes;  — Trim systems. |  |  |  |  |  |
| 7L.2 Airframe | — Landing gear: characteristics of landing gears and shock absorber strut, extension, brakes, drum, disks, wheel, tyre, retraction mechanism, electrical retraction, emergency;  — Wing to fuselage mounting points, empennage (fin and tail plane) to fuselage mounting points, control surface mounting points;  — Permissible maintenance measures;  — Towing: towing/lifting equipment/mechanism;  — Cabin: seats and safety harness, cabin arrangement, windshields, windows, placards, baggage compartment, cockpit controls, cabin air system, blower;  — Water ballast: water reservoirs, lines, valves, drains, vents, tests;  — Fuel system: tanks, lines, filters, vents, drains, filling, selector valve, pumps, indication, tests, bonding;  — Hydraulics: system layout, accumulators, pressure and power distribution, indication;  — Liquid and gas: hydraulic, other fluids, levels, reservoir, lines, valves, filter;  — Protections: firewalls, fire protection, lightning strike bonding, turnbuckles, locking devices, dischargers. |  |  |  |  |  |
| 7L.3 Fasteners | — Reliability of pins, rivets, screws;  — Control cables, turnbuckles;  — Quick-release couplings (L'Hotellier, SZD, Poland). |  |  |  |  |  |
| 7L.4 Locking equipment | — Admissibility of locking methods, locking pins, spring steel pins, locking wire, stop nuts, paint;  — Quick-release couplings. |  |  |  |  |  |
| 7L.6 Rescue systems | Rescue systems |  |  |  |  |  |
| 7L.7 On-board modules | — Pitot-static system, vacuum/dynamic system, hydrostatic test;  — Flight instruments: airspeed indicator, altimeter, vertical-speed indicator, connection and functioning, markings;  — Arrangement and display, panel, electrical wires;  — Gyroscopes, filters, indicating instruments; testing of function;  — Magnetic compass: installation and compass swing;  — Sailplanes: acoustic vertical-speed indicator, flight recorders, anticollision aid;  — Oxygen system. |  |  |  |  |  |
| 7L.8 On-board modules installation and connections | — Flight instruments, mounting requirements (emergency landing conditions as per CS-22);  — Electric wiring, power sources, types of storage batteries, electrical parameters, electric generator, circuit breaker, energy balance, earth/ground, connectors, terminals, warnings, fuses, lamps, lightings, switches, voltmeters, ampere meters, electrical gauges. |  |  |  |  |  |
| 7L.9 Piston engine propulsion | Interface between power plant and airframe. |  |  |  |  |  |
| 7L.10 Propeller | — Inspection;  — Replacement;  — Balancing. |  |  |  |  |  |
| 7L.11 Retraction system | — Propeller position control;  — Engine and/or propeller retraction system. |  |  |  |  |  |
| 7L.12 Physical inspection procedures | — Cleaning, use of lighting and mirrors;  — Measuring tools;  — Measure of controls deflection;  — Torque of screws and bolts;  — Wear of bearings;  — Inspection equipment;  — Calibration of measuring tools. |  |  |  |  |  |

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| Module 8L : Powerplant | |  | Level | | | |
| Sub module | Subject | Syllabus | L1 | L2 | L3 | NE |
| 8L.1 Noise limits | — Explanation of the concept of ‘noise level’;  — Noise certificate;  — Enhanced sound proofing;  — Possible reduction of sound emissions. |  |  |  |  |  |
| 8L.2 Piston engines | — Four-stroke spark ignition engine, air-cooled engine, fluid-cooled engine;  — Two-stroke engine;  — Rotary-piston engine;  — Efficiency and influencing factors (pressure–volume diagram, power curve);  — Noise control devices. |  |  |  |  |  |
| 8L.3 Propeller | — Blade, spinner, backplate, accumulator pressure, hub;  — Operation of propellers;  — Variable-pitch propellers, ground and in-flight adjustable propellers, mechanically, electrically and hydraulically;  — Balancing (static, dynamic);  — Noise problems. |  |  |  |  |  |
| 8L.4 Engine control devices | — Mechanical control devices;  — Electrical control devices;  — Tank displays;  — Functions, characteristics, typical errors and error indications. |  |  |  |  |  |
| 8L.5 Hosepipes | — Material and machining of fuel and oil hoses;  — Control of life limit. |  |  |  |  |  |
| 8L.6 Accessories | — Operation of magneto ignition;  — Control of maintenance limits;  — Operation of carburettors;  — Maintenance instructions on characteristic features;  — Electric fuel pumps;  — Operation of propeller controls;  — Electrically operated propeller control;  — Hydraulically operated propeller control. |  |  |  |  |  |
| 8L.7 Ignition system | — Constructions: coil ignition, magneto ignition, and thyristor ignition;  — Efficiency of the ignition and preheat system;  — Modules of the ignition and preheat system;  — Inspection and testing of a spark plug. |  |  |  |  |  |
| 8L.8 Induction and exhaust systems | — Operation and assembly;  — Silencers and heater installations;  — Nacelles and cowlings;  — Inspection and test;  — CO emission test. |  |  |  |  |  |
| 8L.9 Fuels and lubricants | — Fuel characteristics;  — Labelling, environmentally friendly storage;  — Mineral and synthetic lubricating oils and their parameters: labelling and characteristics, application;  — Environmentally friendly storage and proper disposal of used oil. |  |  |  |  |  |
| 8L.10 Documentation | — Manufacturer documents for the engine and propeller;  — Instructions for Continuing Airworthiness (ICA);  — Aircraft Flight Manuals (AFMs) and Aircraft Maintenance Manuals (AMMs);  — Time Between Overhaul (TBO);  — Airworthiness Directives (ADs), technical notes and service bulletins. |  |  |  |  |  |
| 8L.11 Illustrative material | — Cylinder unit with valve;  — Carburettor;  — High-tension magneto;  — Differential-compression tester for cylinders;  — Overheated/damaged pistons;  — Spark plugs of engines that were operated differently. |  |  |  |  |  |
| 8L.12 Practical experience | — Work safety/accident prevention (handling of fuels and lubricants, start-up of engines);  — Rigging-engine control rods and Bowden cables;  — Setting of no-load speed;  — Checking and setting the ignition point;  — Operational test of magnetos;  — Checking the ignition system;  — Testing and cleaning of spark plugs;  — Performance of the engine tasks contained in an aeroplane 100-hour/annual inspection;  — Cylinder compression test;  — Static test and evaluation of the engine run;  — Documentation of maintenance work including replacement of components. |  |  |  |  |  |
| 8L.13 Gas exchange in internal-combustion engines | — Four-stroke reciprocating engine and control units;  — Energy losses;  — Ignition timing;  — Direct flow behaviour of control units;  — Wankel engine and control units;  — Two-stroke engine and control units;  — Scavenging;  — Scavenging blower;  — Idle range and power range. |  |  |  |  |  |
| 8L.14 Ignition, combustion and carburation | — Ignition;  — Spark plugs;  — Ignition system;  — Combustion process;  — Normal combustion;  — Efficiency and medium pressure;  — Engine knock and octane rating;  — Combustion chamber shapes;  — Fuel/air mix in the carburettor;  — Carburettor principle, carburettor equation;  — Simple carburettor;  — Problems of the simple carburettor and their solutions;  — Carburettor models;  — Fuel/air mix during injection;  — Mechanically controlled injection;  — Electronically controlled injection;  — Continuous injection;  — Carburettor-injection comparison. |  |  |  |  |  |
| 8L.15 Flight instruments in aircraft with injection engines | — Special flight instruments (injection engine);  — Interpretation of indications in a static test;  — Interpretation of indications in flight at various flight levels. |  |  |  |  |  |
| 8L.16 Maintenance of aircraft with injection engines | — Documentation, manufacturer documents, etc.;  — General maintenance instructions (hourly inspections);  — Functional tests;  — Ground test run;  — Test flight;  — Troubleshooting in the event of faults in the injection system and their correction. |  |  |  |  |  |
| 8L.17 Workplace safety and safety provisions | Work safety and safety provisions for work on injection systems. |  |  |  |  |  |
| 8L.18 Visual aids: | — Carburettor;  — Components of injection system;  — Aircraft with injection engine;  — Tool for work on injection systems. |  |  |  |  |  |
| 8L.19 Electrical propulsion | — Energy system, accumulators, installation;  — Electrical motor;  — Heat, noise and vibration checks;  — Testing windings;  — Electrical wiring and control systems;  — Pylon, extension and retraction systems;  — Motor/propeller brake systems;  — Motor ventilation systems;  — Practical experience of 100-hour/annual inspections. |  |  |  |  |  |
| 8L.20 Jet propulsion | — Engine installation;  — Pylon, extension and retraction systems;  — Fire protection;  — Fuel systems including lubrication;  — Engine starting systems, gas assist;  — Engine damage assessment;  — Engine servicing;  — Engine removal / refit and test;  — Practical experience of conditional / run time / annual inspections;  — Conditional inspections. |  |  |  |  |  |
| 8L.21 FADEC | 8L.21 Full authority digital engine control (FADEC) |  |  |  |  |  |

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| Module 9L : Balloon / Airship hot air | |  | Level | | | |
| Sub module | Subject | Syllabus | L1 | L2 | L3 | NE |
| 9L.1 Basic principles and assembly of hot-air balloons/airships | — Assembly and individual parts;  — Envelopes;  — Envelope Materials;  — Envelope Systems;  — Conventional and special shapes;  — Fuel System;  — Burner, burner frame and burner support rods;  — Compressed-gas cylinders and compressed-gas hoses;  — Basket and alternative devices (seats);  — Rigging accessories;  — Maintenance and servicing tasks;  — Annual/100-hour inspection;  — Log Books;  — Aircraft Flight Manuals (AFMs) and Aircraft Maintenance Manuals (AMMs);  — Rigging and launch preparation (launch restraint);  — Launch. |  |  |  |  |  |
| 9L.2 Practical training | Operating controls, maintenance and servicing jobs (according to flight manual). |  |  |  |  |  |
| 9L.3 Envelope | — Fabrics;  — Seams;  — Load tapes, rip stoppers;  — Crown rings;  — Parachute valve and fast-deflation systems;  — Ripping panel;  — Turning vent;  — Diaphragms/catenaries (special shapes and airships);  — Rollers, pulleys;  — Control and shroud lines;  — Knots;  — Temperature indication label, temperature flag, envelope thermometer;  — Flying wires;  — Fittings, karabiners. |  |  |  |  |  |
| 9L.4 Burner and fuel system | — Burner coils;  — Blast, liquid and pilot valves;  — Burners/jets;  — Pilot lights/vaporisers/jets;  — Burner frame;  — Fuel lines/hoses;  — Fuel cylinders, valves and fittings. |  |  |  |  |  |
| 9L.5 Basket and basket suspension (incl. alternative devices) | — Types of baskets (incl. alternative devices);  — Basket materials: cane and willow, hide, wood, trim materials, suspension cables;  — Seats, roller bearings;  — Karabiner, shackle and pins;  — Burner support rods;  — Fuel cylinder straps;  — Accessories. |  |  |  |  |  |
| 9L.6 Equipment | — Fire extinguisher, fire blanket;  — Instruments (single or combined). |  |  |  |  |  |
| 9L.7 Minor repairs | — Stitching;  — Bonding;  — Basket hide/trim repairs. |  |  |  |  |  |
| 9L.8 Procedures for physical inspection | — Cleaning, use of lighting and mirrors;  — Measuring tools;  — Measure of controls deflection (only airships);  — Torque of screws and bolts;  — Wear of bearings (only airships);  — Inspection equipment;  — Calibration of measuring tools;  — Fabric Grab Test. |  |  |  |  |  |

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| Module 10L: Balloon/ airship gas (free/ tethered) | |  | Level | | | |
| Sub module | Subject | Syllabus | L1 | L2 | L3 | NE |
| 10L.1 Basic principles and assembly of gas balloons/airships | — Assembly of individual parts;  — Envelope and netting material;  — Envelope, ripping panel, emergency opening, cords and belts;  — Rigid gas valve;  — Flexible gas valve (parachute);  — Netting;  — Load ring;  — Basket and accessories (including alternative devices);  — Electrostatic discharge paths;  — Mooring line and drag rope;  — Maintenance and servicing;  — Annual inspection;  — Flight papers;  — Aircraft Flight Manuals (AFMs) and Aircraft Maintenance Manuals (AMMs);  — Rigging and launch preparation;  — Launch. |  |  |  |  |  |
| 10L.2 Practical training | — Operating controls;  — Maintenance and servicing jobs (according to AMM and AFM);  — Safety rules when using hydrogen as lifting gas. |  |  |  |  |  |
| 10L.3 Envelope | — Fabrics;  — Poles and reinforcement of pole;  — Ripping panel and cord;  — Parachute and shroud lines;  — Valves and cords;  — Filler neck, Poeschel-ring and cords;  — Electrostatic discharge paths. |  |  |  |  |  |
| 10L.4 Valve | — Springs;  — Gaskets;  — Screwed joints;  — Control lines;  — Electrostatic discharge paths. |  |  |  |  |  |
| 10L.5 Netting or rigging (without net) | — Kinds of net and other lines;  — Mesh sizes and angles;  — Net ring;  — Knotting methods;  — Electrostatic discharge paths. |  |  |  |  |  |
| 10L.6 Load ring | — Load ring |  |  |  |  |  |
| 10L.7 Basket (incl. alternative devices) | — Kinds of baskets (incl. alternative devices);  — Strops and toggles;  — Ballast system (bags and supports);  — Electrostatic discharge paths. |  |  |  |  |  |
| 10L.8 Ripping cord and valve cords | Ripping cord and valve cords |  |  |  |  |  |
| 10L.9 Mooring line and drag rope | Mooring line and drag rope |  |  |  |  |  |
| 10L.10 Minor repairs | — Bonding;  — Splicing hemp ropes. |  |  |  |  |  |
| 10L.11 Equipment | Instruments (single or combined). |  |  |  |  |  |
| 10L.12 Tether cable (tethered gas balloons (TGB) only) | — Kinds of cables;  — Acceptable damage of cable;  — Cable swivel;  — Cable clamps. |  |  |  |  |  |
| 10L.13 Winch (tethered gas balloons only) | — Kinds of winches;  — Mechanical system;  — Electrical system;  — Emergency system;  — Grounding/ballasting of winch. |  |  |  |  |  |
| 10L.14 Procedures for physical inspection | — Cleaning, use of lighting and mirrors;  — Measuring tools;  — Measure of controls deflection (only airships);  — Torque of screws and bolts;  — Wear of bearings (only airships);  — Inspection equipment;  — Calibration of measuring tools;  — Fabric grab test. |  |  |  |  |  |

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| Module 11L : Airships Hot Air/Gas | |  | Level | | | | |
| Sub module | Subject | Syllabus | L1 | L2 | L3 | NE |
| 11L.1 Basic principles and assembly of small airships | — Envelope, ballonnets;  — Valves, openings;  — Gondola;  — Propulsion;  — Aircraft Flight Manuals (AFMs) and Aircraft Maintenance Manuals (AMMs);  — Rigging and launch preparation. |  |  |  |  |  |
| 11L.2 Practical training | — Operating controls;  — Maintenance and servicing jobs (according to AMM and AFM). |  |  |  |  |  |
| 11L.3 Envelope | — Fabrics;  — Ripping panel and cords;  — Valves;  — Catenary system. |  |  |  |  |  |
| 11L.4 Gondola (incl. alternative devices) | — Kinds of gondolas (incl. alternative devices);  — Airframe types and materials;  — Identification of damage. |  |  |  |  |  |
| 11L.5 Electrical system | — Basics about on-board electrical circuits;  — Electrical sources (accumulators, fixation, ventilation, corrosion);  — Lead, nickel-cadmium (NiCd) or other accumulators, dry batteries;  — Generators;  — Wiring, electrical connections;  — Fuses;  — External power source;  — Energy balance. |  |  |  |  |  |
| 11L.6 Propulsion | — Fuel system: tanks, lines, filters, vents, drains, filling, selector valve, pumps, indication, tests, bonding;  — Propulsion instruments;  — Basics about measuring and instruments;  — Revolution measuring;  — Pressure measuring;  — Temperature measuring;  — Available fuel/power measuring. |  |  |  |  |  |
| 11L.7 Equipment | — Fire extinguisher, fire blanket;  — Instruments (single or combined). |  |  |  |  |  |

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| Module 12L : Radio COM/ELT/ Transponder/ Instruments | |  | Level | | | |
| Sub module | Subject | Syllabus | L1 | L2 | L3 | NE | |
| 12L.1 Radio Com/ELT | — Channel spacing;  — Basic functional test;  — Batteries;  — Testing and maintenance requirements. |  |  |  |  |  | |
| 12L.2 Transponder | — Basic operation;  — Typical portable configuration including antenna;  — Explanation of Modes A, C, S;  — Testing and maintenance requirements. |  |  |  |  |  | |
| 12L.3 Instruments | — Handheld altimeter/variometers;  — Batteries;  — Basic functional test. |  |  |  |  |  | |

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| Practical Training | | | |  |
|  | Mechanical equipment | Electrical equipment | Electronic equipment | Short description of duration / content of practical training |
| Manufacturing of |  |  |  |  |
| Manufacturing of |  |  |  |  |
| Manufacturing of |  |  |  |  |
| Repair of |  |  |  |  |
| Repair of |  |  |  |  |
| Repair of |  |  |  |  |
| Overhaul of |  |  |  |  |
| Overhaul of |  |  |  |  |
| Overhaul of |  |  |  |  |
| Inspection of |  |  |  |  |
| Inspection of |  |  |  |  |
| Inspection of |  |  |  |  |
| Use of tools |  |  |  |  |
| Use of tools |  |  |  |  |
| Use of tools |  |  |  |  |
| Use of measuring equipment |  |  |  |  |
| Use of measuring equipment |  |  |  |  |
| Use of measuring equipment |  |  |  |  |