

**UKCAA to EASA Part 66 Module Differences
post implementation of EU 2023/989 on 12th June 2024**

For the table below:

- Column A indicates the module and its topic sub part.
- Column B indicates the overarching topic title.
- Column C shows the UKCAA/Pre-2023/989 topics covered in this sub part.
- Column D,E & F indicate the UKCAA/Pre-2023/989 Part 66 knowledge levels examined at. The colouring is to help differentiate the levels.
- Column G shows the EU 2023/989 topics covered in this sub part.
- Column H, I & J indicate the EU 2023/989 Part 66 knowledge levels examined at. The colouring is to help differentiate the levels.
- Where columns C and G are coloured green, this indicates that the sub part topics are the same
- Where columns C and G are not coloured (i.e. white), this indicates that the sub part topics are different between the UKCAA/Pre-2023/989 and EU 2023/989 requirements.

Module	Topic	UKCAA/Pre-2023/989 Part 66 module part topics and related category knowledge levels			EU 2023/989 Part 66 module part topics and related category knowledge levels				
		A	B1.1	B2	A	B1.1	B2		
1.1	Arithmetic	Arithmetical terms & signs, methods of multiplication & division, fractions & decimals, factors & multiples, weights, measures & conversion factors, ratio & proportion, averages & percentages, areas & volumes, squares, cubes, square & cube roots.	1	2	2	Arithmetical terms & signs, methods of multiplication & division, fractions & decimals, factors & multiples, weights, measures & conversion factors, ratio & proportion, averages & percentages, areas & volumes, squares, cubes, square & cube roots.	1	2	2
1.2a	Algebra	Evaluating simple algebraic expressions, addition, subtraction, multiplication & division, use of brackets, simple algebraic fractions;	1	2	2	Evaluating simple algebraic expressions, addition, subtraction, multiplication & division, use of brackets, simple algebraic fractions;	1	2	2
1.2b	Algebra	Linear equations & their solutions; Indices & powers, negative & fractional indices; Binary & other applicable numbering systems; Simultaneous equations & second-degree equations with one unknown; Logarithms.	0	1	1	Linear equations & their solutions; Indices & powers, negative & fractional indices; Binary & other applicable numbering systems; Simultaneous equations & second-degree equations with one unknown; Logarithms.	0	1	1
1.3a	Geometry	Simple geometrical constructions;	0	1	1	Simple geometrical constructions;	0	1	1
1.3b	Geometry	Graphical representation: nature & uses of graphs, graphs of equations/functions;	2	2	2	Graphical representation: nature & uses of graphs, graphs of equations/functions;	2	2	2
1.3c	Geometry	Simple trigonometry: trigonometrical relationships, use of tables & rectangular & polar coordinates.	0	2	2	Simple trigonometry: trigonometrical relationships, use of tables & rectangular & polar coordinates.	0	2	2
2.1	Matter	Nature of matter: the chemical elements, structure of atoms, molecules; Chemical compounds; States: solid, liquid, & gaseous; Changes between states.	1	1	1	Nature of matter: the chemical elements, structure of atoms, molecules; Chemical compounds; States: solid, liquid, & gaseous; Changes between states.	1	2	2
2.2.1	Mechanics Statics	Forces, moments & couples, representation as vectors; Centre of gravity; Elements of theory of stress, strain, & elasticity: tension, compression, shear, & torsion; Nature & properties of solid, fluid, & gas matter; Pressure & buoyancy in liquids (barometers).	1	2	1	Forces, moments & couples, representation as vectors; Centre of gravity; Elements of theory of stress, strain, & elasticity: tension, compression, shear, & torsion; Nature & properties of solid, fluid, & gas matter; Pressure & buoyancy in liquids (barometers).	1	2	2
2.2.2	Mechanics 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, & resonance; Velocity ratio, mechanical advantage, & efficiency.	1	2	1	Linear movement: uniform motion in a straight line, motion under constant acceleration (motion under gravity); Rotational movement: uniform circular motion (centrifugal/centripetal forces); Periodic motion: pendular movement; Simple theory of vibration, harmonics, & resonance; Velocity ratio, mechanical advantage, & efficiency.	1	2	2
2.2.3a	Mechanics Dynamics	Mass; Force, inertia, work, power, energy (potential, kinetic & total energy), heat, efficiency;	1	2	1	Mass; Force, inertia, work, power, energy (potential, kinetic & total energy), heat, efficiency;	1	2	2
2.2.3b	Mechanics Dynamics	Momentum, conservation of momentum; Impulse; Gyroscopic principles; Friction: nature & effects, coefficient of friction (rolling resistance).	1	2	2	Momentum, conservation of momentum; Impulse; Gyroscopic principles; Friction: nature & effects, coefficient of friction (rolling resistance).	1	2	2
2.2.4a	Mechanics Fluid dynamics	Specific gravity & density;	2	2	2	Specific gravity & density;	2	2	2
2.2.4b	Mechanics	Viscosity, fluid resistance, effects of streamlining; Effects of compressibility on fluids; Static, dynamic, & total pressure: Bernoulli's Theorem, venturi.	1	2	1	Viscosity, fluid resistance, effects of streamlining; Effects of compressibility on fluids; Static, dynamic, & total pressure: Bernoulli's Theorem, venturi.	1	2	2
2.3a	Thermodynamics	Temperature: thermometers & temperature scales (Celsius, Fahrenheit & Kelvin); definition of heat;	2	2	2	Temperature: thermometers & temperature scales (Celsius, Fahrenheit & Kelvin); definition of heat;	2	2	2

2.3b	Thermodynamics	Heat capacity, specific heat; Heat transfer: convection, radiation & conduction; Volumetric expansion; First & second law of thermodynamics; Gases: ideal gases laws; specific heat at constant volume & constant pressure, work done by expanding gas; Isothermal, adiabatic expansion & compression, engine cycles, constant volume & constant pressure, refrigerators & heat pumps; Latent heats of fusion & evaporation, thermal energy, heat of combustion.	0	2	2	Heat capacity, specific heat; Heat transfer: convection, radiation & conduction; Volumetric expansion; First & second law of thermodynamics; Gases: ideal gases laws; specific heat at constant volume & constant pressure, work done by expanding gas; Isothermal, adiabatic expansion & compression, engine cycles, constant volume & constant pressure, refrigerators & heat pumps; Latent heats of fusion & evaporation, thermal energy, heat of combustion.	1	2	2
2.4	Optics (Light)	Nature of light; speed of light; Laws of reflection & refraction: reflection at plane surfaces, reflection by spherical mirrors, refraction, lenses; Fibre optics.	0	2	2	Nature of light; speed of light; Laws of reflection & refraction: reflection at plane surfaces, reflection by spherical mirrors, refraction, lenses; Fibre optics.	0	2	2
2.5	Wave motion & sound	Wave motion: mechanical waves, sinusoidal wave motion, interference phenomena, standing waves; Sound: speed of sound, production of sound, intensity, pitch & quality, Doppler effect.	0	2	2	Wave motion: mechanical waves, sinusoidal wave motion, interference phenomena, standing waves; Sound: speed of sound, production of sound, intensity, pitch & quality, Doppler effect.	0	2	2
3.1	Electron Theory	Structure & distribution of electrical charges within atoms, molecules, ions, & compounds; Molecular structure of conductors, semiconductors, & insulators.	1	1	1	Structure & distribution of electrical charges within atoms, molecules, ions, & compounds; Molecular structure of conductors, semiconductors, & insulators.	1	1	1
3.2	Static Electricity & Conduction	Static electricity & distribution of electrostatic charges; Electrostatic laws of attraction & repulsion; Units of charge, Coulomb's law; Conduction of electricity in solids, liquids, gases & in vacuum.	1	2	2	Static electricity & distribution of electrostatic charges; Electrostatic laws of attraction & repulsion; Units of charge, Coulomb's law; Conduction of electricity in solids, liquids, gases & in vacuum.	1	2	2
3.3	Electrical Terminology	The following terms, their units & factors affecting them: potential difference, electromotive force, voltage, current, resistance, conductance, charge, conventional current flow, electron flow.	1	2	2	The following terms, their units & factors affecting them: potential difference, electromotive force, voltage, current, resistance, conductance, charge, conventional current flow, electron flow.	1	2	2
3.4	Generation of Electricity	Production of electricity by the following methods: light, heat, friction, pressure, chemical reaction, magnetism, & motion.	1	1	1	Production of electricity by the following methods: light, heat, friction, pressure, chemical reaction, magnetism, & motion.	1	1	1
3.5	DC Sources of Electricity	Construction & basic chemical action of: primary cells, secondary cells, lead acid cells, nickel cadmium cells, other alkaline cells; Cells connected in series & parallel; Internal resistance & its effect on a battery; Construction, materials & operation of thermocouples; Operation of photo-cells.	1	2	2	Construction & basic chemical reaction of primary cells, secondary cells, lead acid cells, nickel cadmium cells, lithium cells, nickel cells & other alkaline cells; Cells connected in series & in parallel; Internal resistance & its effect on a battery; Construction, materials, & operation of thermocouples; Operation of photocells.	1	2	2
3.6	DC Circuits	Ohm's law, Kirchhoff's voltage, & current laws; Calculations using the above laws to find resistance, voltage, & current; Significance of the internal resistance of a supply.	0	2	2	Ohm's law, Kirchhoff's voltage, & current laws; Calculations using the above laws to find resistance, voltage, & current; Significance of the internal resistance of a supply.	1	2	2
3.7a	Resistance/Resistor	Resistance & affecting factors; Specific resistance; Resistor colour code, values & tolerances, preferred values, wattage ratings; Resistors in series & parallel; Calculation of total resistance using series, parallel & series parallel combinations; Operation & use of potentiometers & rheostats; Operation of Wheatstone Bridge;	0	2	2	Resistance Specific resistance; Calculation of total resistance using series, parallel & series-parallel combinations; Operation & use of potentiometers & rheostats; Operation of Wheatstone Bridge.	0	2	2
3.7b	Resistance/Resistor	Positive & negative temperature coefficient conductance; Fixed resistors, stability, tolerance & limitations, methods of construction; Variable resistors, thermistors, voltage dependent resistors; Construction of potentiometers & rheostats; Construction of Wheatstone Bridge.	0	1	1	Resistor Positive & negative temperature coefficient conductance; Resistor colour code, values & tolerances, preferred values, wattage ratings; Resistors in series & in parallel; Fixed resistors, stability, tolerance & limitations, methods of construction; Variable resistors, thermistors, voltage-dependent resistors; Construction of potentiometers & rheostats; Construction of Wheatstone Bridge.	0	1	1
3.8	Power	Power, work, & energy (kinetic & potential); Dissipation of power by a resistor; Power formula; Calculations involving power, work, & energy.	0	2	2	Power, work, & energy (kinetic & potential); Dissipation of power by a resistor; Power formula; Calculations involving power, work, & energy.	0	2	2
3.9	Capacitance/Capacitor	Operation & function of a capacitor; Factors that affect the capacitance area of plates, distance between plates, number of plates, dielectric & dielectric constant, working voltage, voltage rating; Capacitor types, construction, & function; Capacitor colour-coding; Calculations of capacitance & voltage in series & in parallel circuits; Exponential charge & discharge of a capacitor, time constants; Testing of capacitors.	0	2	2	Operation & function of a capacitor; Factors that affect the capacitance area of plates, distance between plates, number of plates, dielectric & dielectric constant, working voltage, voltage rating; Capacitor types, construction, & function; Capacitor colour-coding; Calculations of capacitance & voltage in series & in parallel circuits; Exponential charge & discharge of a capacitor, time constants; Testing of capacitors.	0	2	2

3.10a	Magnetism	Theory of magnetism; Properties of a magnet; Action of a magnet suspended in the Earth's magnetic field; Magnetisation & demagnetisation; Magnetic shielding; Various types of magnetic material; Electromagnets construction & principles of operation; Handclasp rules to determine: magnetic field around current-carrying conductor.	0	2	2	Theory of magnetism; Properties of a magnet; Action of a magnet suspended in the Earth's magnetic field; Magnetisation & demagnetisation; Magnetic shielding; Various types of magnetic material; Electromagnets construction & principles of operation; Handclasp rules to determine: magnetic field around current-carrying conductor.	0	2	2
3.10b	Magnetism	Magnetomotive force, field strength, magnetic flux density, permeability, hysteresis loop, retentivity, coercive force reluctance, saturation point, eddy currents; Precautions for care & storage of magnets.	0	2	2	Magnetomotive force, field strength, magnetic flux density, permeability, hysteresis loop, retentivity, coercive force reluctance, saturation point, eddy currents; Precautions for care & storage of magnets.	0	2	2
3.11	Inductance/Inductor	Faraday's law; Action of inducing a voltage in a conductor that moves in a magnetic field; Induction principles; Effects of the following on the magnitude of an induced voltage: magnetic field strength, rate of change of flux, number of conductor turns; Mutual induction; The effect that the rates of change of primary current & mutual inductance have on induced voltage; Factors that affect mutual inductance: number of turns in the coil, physical size of the coil, permeability of the coil, position of coils with respect to each other; Lenz's law & polarity determining rules; Back EMF, self-induction; Saturation point; Principle uses of inductors.	0	2	2	Faraday's law; Action of inducing a voltage in a conductor that moves in a magnetic field; Induction principles; Effects of the following on the magnitude of an induced voltage: magnetic field strength, rate of change of flux, number of conductor turns; Mutual induction; The effect that the rates of change of primary current & mutual inductance have on induced voltage; Factors that affect mutual inductance: number of turns in the coil, physical size of the coil, permeability of the coil, position of coils with respect to each other; Lenz's law & polarity determining rules; Back EMF, self-induction; Saturation point; Principle uses of inductors.	0	2	2
3.12	DC Motor/Generator Theory	Basic motor & generator theory; Construction & purpose of components in a DC generator; Operation of, & factors that affect the output & direction of the current flow in DC generators; Operation of, & factors that affect the output power, torque, speed, & direction of rotation of DC motors; Series-wound, shunt-wound & compound motors; Starter generator construction.	0	2	2	Basic motor & generator theory; Construction & purpose of components in a DC generator; Operation of, & factors that affect the output & direction of the current flow in DC generators; Operation of, & factors that affect the output power, torque, speed, & direction of rotation of DC motors; Series-wound, shunt-wound & compound motors; Starter generator construction.	0	2	2
3.13	AC Theory	Sinusoidal waveform: phase, period, frequency, cycle; Instantaneous, average, root mean square, peak, peak-to-peak current values & calculations of these values, in relation to voltage, current & power; Triangular/Square waves; Single-phase/Three-phase principles.	1	2	2	Sinusoidal waveform: phase, period, frequency, cycle; Instantaneous, average, root mean square, peak, peak-to-peak current values & calculations of these values, in relation to voltage, current & power; Triangular/Square waves; Single-phase/Three-phase principles.	1	2	2
3.14	Resistive (R), Capacitive (C) & Inductive (L) Circuits	Phase the relationship of voltage & current in L, C & R circuits, parallel, series & series-parallel; Power dissipation in L, C & R circuits; Impedance, phase angle, power factor & current calculations; True power, apparent power, & reactive power calculations.	0	2	2	Phase the relationship of voltage & current in L, C & R circuits, parallel, series & series-parallel; Power dissipation in L, C & R circuits; Impedance, phase angle, power factor & current calculations; True power, apparent power, & reactive power calculations.	0	2	2
3.15	Transformers	Transformer construction principles & operation; Transformer losses & methods for overcoming them; Transformer action under load & no-load conditions; Power transfer, efficiency, polarity markings; Calculation of line & phase voltages & currents; Calculation of power in a three-phase system; Primary & secondary current, voltage, turns ratio, power, efficiency; Auto-transformers.	0	2	2	Transformer construction principles & operation; Transformer losses & methods for overcoming them; Transformer action under load & no-load conditions; Power transfer, efficiency, polarity markings; Calculation of line & phase voltages & currents; Calculation of power in a three-phase system; Primary & secondary current, voltage, turns ratio, power, efficiency; Auto-transformers.	0	2	2
3.16	Filters	Operation, application, & uses of the following filters: low pass, high pass, band pass, band stop.	0	1	1	Operation, application, & uses of the following filters: low pass, high pass, band pass, band stop.	0	1	1
3.17	AC Generators	Rotation of loop in a magnetic field & waveform produced; Operation & construction of revolving armature & revolving field type AC generators; Single-phase, two-phase, & three-phase alternators; Three-phase star & delta connections advantages, & uses; Permanent magnet generators.	0	2	2	Rotation of loop in a magnetic field & waveform produced; Operation & construction of revolving armature & revolving field type AC generators; Single-phase, two-phase, & three-phase alternators; Three-phase star & delta connections advantages, & uses; Permanent magnet generators.	0	2	2
3.18	AC Motors	Construction, principles of operation & characteristics of: AC synchronous & induction motors both single-phase & polyphase; Methods of speed control & direction of rotation; Methods of producing a rotating field: capacitor, inductor, shaded or split pole.	0	2	2	Construction, principles of operation & characteristics of: AC synchronous & induction motors both single-phase & polyphase; Methods of speed control & direction of rotation; Methods of producing a rotating field: capacitor, shaded or split pole.	0	2	2

4.1.1a	Semiconductors Diodes	Diode symbols; Diode characteristics & properties; Diodes in series & parallel; Main characteristics & use of silicon controlled rectifiers (thyristors), light emitting diode, photo conductive diode, varistor, rectifier diodes; Functional testing of diodes.	2	2	Description & characteristics Diode symbols; Diode characteristics & properties; Diodes in series & in parallel; Materials, electron configuration, electrical properties; P & N type materials: effects of impurities on conduction, majority & minority characters; P-N junction in a semiconductor, development of a potential across a P-N junction in unbiased, forward-biased & reverse-biased conditions; Diode parameters: peak inverse voltage, maximum forward current, temperature, frequency, leakage current, power dissipation; Main characteristics & use of silicon-controlled rectifiers (thyristors), light-emitting diodes (LEDs), photo-conductive diodes, rectifier diodes.	2	2		
4.1.1b	Semiconductors Diodes	Materials, electron configuration, electrical properties; P & N type materials: effects of impurities on conduction, majority & minority characters; PN junction in a semiconductor, development of a potential across a PN junction in unbiased, forward biased & reverse biased conditions; Diode parameters: peak inverse voltage, maximum forward current, temperature, frequency, leakage current, power dissipation; Operation & function of diodes in the following circuits: clippers, clampers, full & half wave rectifiers, bridge rectifiers, voltage doublers & triplers; Detailed operation & characteristics of the following devices: silicon controlled rectifier (thyristor), light emitting diode, Schottky diode, photo conductive diode, varactor diode, varistor, rectifier diodes, Zener diode. Functional testing of diodes.	0	2	Operation & function Operation & function of diodes in the following circuits: clippers, clampers, full- & half-wave rectifiers, bridge rectifiers, voltage doublers & triplers; Detailed operation & characteristics of the following devices: silicon-controlled rectifier (thyristor), light-emitting diode (LED), Schottky diode, photo-conductive diode, varactor diode, varistor, rectifier diodes, Zener diode. Functional testing of diodes.	0	2		
4.1.2a	Transistors	Description & characteristics Transistor symbols; Component description & orientation; Transistor characteristics & properties.	1	2	Description & characteristics Transistor symbols; Component description & orientation; Transistor characteristics & properties.	1	2		
4.1.2b	Transistors	Construction & operation of PNP & NPN transistors; Base, collector & emitter configurations; Testing of transistors; Basic appreciation of other transistor types & their uses; Application of transistors: classes of amplifier (A, B, C); Simple circuits including: bias, decoupling, feedback & stabilisation; Multistage circuit principles: cascades, push-pull, oscillators, multivibrators, flip-flop circuits.	0	2	Construction & operation Construction & operation of PNP & NPN transistors; Base, collector & emitter configurations; Testing of transistors; Basic appreciation of other transistor types, including types of FET & their uses; Application of transistors: amplifier classes (A, B, C); Simple circuits including bias, decoupling, feedback & stabilisation; Multistage circuit principles: cascades, push-pull, oscillators, multivibrators, flip-flop circuits; Operation & amplifier stages connecting methods: resistive, capacitive, direct, inverting, non-inverting & adding.	0	2		
4.1.3a	Integrated Circuits	Description & operation of logic circuits & linear circuits/operational amplifiers;	1	0	Description & operation of logic circuits & linear circuits/operational amplifiers;	1	2		
4.1.3b	Integrated Circuits	Description & operation of logic circuits & linear circuits; Introduction to operation & function of an operational amplifier used as: integrator, differentiator, voltage follower, comparator; Operation & amplifier stages connecting methods: resistive capacitive, inductive (transformer), inductive resistive (IR), direct; Advantages & disadvantages of positive & negative feedback.	0	2	Introduction to the operation & function of an operational amplifier used as: an integrator, a differentiator, a voltage follower, a comparator; Advantages & disadvantages of positive & negative feedback.	0	2		
4.2	Printed Circuit Boards	Description & use of printed circuit boards.	1	2	Description & use of printed circuit boards.	1	2		
4.3a	Servomechanisms	Understanding of the following terms: Open & closed loop systems, feedback, follow up, analogue transducers; Principles of operation & use of the following synchro system components/features: resolvers, differential, control & torque, transformers, inductance & capacitance transmitters;	1	0	Principles Understanding of the following principles: open- & closed-loop systems, servomechanism, feedback, follow-up, null, overshoot, damping, deadband, hunting, proximity switches, analogue transducers, synchro systems & components, digital tachometers & encoders, inductance, & capacitance transmitters;	1	2		
4.3b	Servomechanisms	Understanding of the following terms: Open & closed loop, follow up, servomechanism, analogue, transducer, null, damping, feedback, deadband; Construction operation & use of the following synchro system components: resolvers, differential, control & torque, E & I transformers, inductance transmitters, capacitance transmitters, synchronous transmitters; Servomechanism defects, reversal of synchro leads, hunting.	0	2	Construction operation & use of the following synchro-system components: resolvers, differential, control & torque, E & I transformers, inductance transmitters, capacitance transmitters, synchronous transmitters; Construction, operation & use of servomechanism & PID [Proportional-Integral- Derivative AEV] controller; Fault-finding of servo defects, reversal of synchro leads, hunting.	0	2		
5.1	Electronic Instrument Systems	Typical arrangements of systems & cockpit layout of electronic instrument systems.	1	2	3	Typical arrangements of systems & cockpit layout of electronic instrument systems.	1	1	1
5.2	Numbering systems	binary, octal, & hexadecimal; Demonstration of conversions between the decimal & binary systems, octal & hexadecimal systems & vice versa.	0	1	2	binary, octal, & hexadecimal; Demonstration of conversions between the decimal & binary systems, octal & hexadecimal systems & vice versa.	0	1	2
5.3	Data Conversion	Analogue data, Digital data; Operation & application of analogue-to-digital, & digital-to-analogue converters, inputs & outputs, limitations of various types.	0	1	2	Analogue data, Digital data; Operation & application of analogue-to-digital, & digital-to-analogue converters, inputs & outputs, limitations of various types.	0	1	2
5.4	Data Buses	Operation of data buses in aircraft systems, including knowledge of ARINC & other specifications. Aircraft Network/Ethernet.	0	2	2	Operation of data buses in aircraft systems, including knowledge of ARINC & other specifications. Aircraft network/Ethernet.	0	2	2
5.5a	Logic Circuits	Identification of common logic gate symbols, tables & equivalent circuits; Applications used for aircraft systems, schematic diagrams.	0	2	2	Identification of common logic gate symbols, tables & equivalent circuits; Applications used for aircraft systems, schematic diagrams.	0	2	2
5.5b	Logic Circuits	Interpretation of logic diagrams.	0	0	2	Interpretation of logic diagrams.	0	0	2

5.6a	Basic Computer Structure	Computer terminology (including bit, byte, software, hardware, CPU, IC, & various memory devices such as RAM, ROM, PROM); Computer technology (as applied in aircraft systems).	1	2	0	Computer terminology (including bit, byte, software, hardware, CPU, IC, & various memory devices such as RAM, ROM, PROM); Computer technology (as applied in aircraft systems).	1	2	0
5.6b	Basic Computer Structure	Computer related terminology; Operation, layout & interface of the major components in a micro computer including their associated bus systems; Information contained in single & multiaddress instruction words; Memory associated terms; Operation of typical memory devices; Operation, advantages & disadvantages of the various data storage systems.	0	0	2	Computer operation, layout, & interface of the major components in a microcomputer, including their associated bus systems; Information contained in single- & multi-address instruction words; Memory-associated terms; Operation of typical memory devices; Operation, advantages, & disadvantages of the various data storage systems.	0	0	2
5.7	Microprocessors	Functions performed & overall operation of a microprocessor; Basic operation of each of the following microprocessor elements: control & processing unit, clock, register, arithmetic logic unit.	0	0	2	Functions performed & overall operation of a microprocessor; Basic operation of each of the following microprocessor elements: control & processing unit, clock, register, arithmetic logic unit.	0	0	2
5.8	Integrated Circuits	Operation & use of encoders & decoders; Function of encoder types; Uses of medium, large & very large scale integration.	0	0	2	Operation & use of encoders & decoders; Function of encoder types.	0	0	2
5.9	Multiplexing Operation	Operation, application & identification in logic diagrams of multiplexers & demultiplexers.	0	0	2	Operation, application & identification in logic diagrams of multiplexers & demultiplexers.	0	0	2
5.10	Fibre Optics	Advantages & 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.	0	1	2	Advantages & 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.	0	1	2
5.11	Electronic Displays	Principles of operation of common types of displays used in modern aircraft, including cathode-ray tubes (CRTs), light-emitting diodes (LEDs) & liquid crystal displays (LCDs).	0	2	2	Principles of operation of common types of displays used in modern aircraft, including cathode-ray tubes (CRTs), light-emitting diodes (LEDs) & liquid crystal displays (LCDs).	1	2	2
5.12	Electrostatic Sensitive Devices	Special handling of components sensitive to electrostatic discharges; Awareness of risks & possible damage, component, & personnel anti-static protection devices.	1	2	2	Special handling of components sensitive to electrostatic discharges; Awareness of risks & possible damage, component, & personnel anti-static protection devices.	1	2	2
5.13	Software Management Control	Awareness of restrictions, airworthiness requirements & possible catastrophic effects of unapproved changes to software programmes.	0	2	2	Awareness of restrictions, airworthiness requirements & possible catastrophic effects of unapproved changes to software programmes.	0	2	2
5.14	Electromagnetic Environment	Influence of the following phenomena on maintenance practices for electronic systems: EMC-Electromagnetic Compatibility, EMI-Electromagnetic Interference, HIRF-High- Intensity Radiated Field, Lightning/lightning protection.	0	2	2	Influence of the following phenomena on maintenance practices for electronic systems: EMC-Electromagnetic Compatibility, EMI-Electromagnetic Interference, HIRF-High- Intensity Radiated Field, Lightning/lightning protection.	0	2	2
5.15a	Typical Electronic/Digital Aircraft Systems	General arrangement of typical electronic/digital aircraft systems & associated BITE (Built In Test Equipment) such as: ACARS-ARINC Communication & Addressing & Reporting System, EICAS-Engine Indication & Crew Alerting System, FBW-Fly-by-Wire, FMS-Flight Management System, IRS-Inertial Reference System;	0	2	2	General arrangement of typical electronic/digital aircraft systems & associated BITE (Built-In Test Equipment), such as: (a) ACARS — ARINC Communication & Addressing & Reporting System, FBW — Fly-by-Wire, FMS — flight management system, IRS — inertial reference system;	1	1	1
5.15b	Typical Electronic/Digital Aircraft Systems	General arrangement of typical electronic/digital aircraft systems & 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.	0	2	2	General arrangement of typical electronic/digital aircraft systems & associated BITE (Built In Test Equipment) such as: ECAM — electronic centralised aircraft monitoring, EICAS — engine indication & crew alerting system, EFIS — electronic flight instrument system, GNSS — global navigation satellite system, TCAS — traffic alert collision avoidance system, Integrated Modular Avionics, Cabin Systems, Information Systems.	1	1	1
6.1a	Aircraft Materials Ferrous	Characteristics, properties & identification of common alloy steels used in aircraft; Heat treatment & application of alloy steels.	1	2	1	Characteristics, properties & identification of common alloy steels used in aircraft; Heat treatment & application of alloy steels.	1	2	1
6.1b	Aircraft Materials Ferrous	Testing of ferrous materials for hardness, tensile strength, fatigue strength & impact resistance.	0	1	1	Testing of ferrous materials for hardness, tensile strength, fatigue strength & impact resistance.	0	1	1
6.1c	Aircraft Materials Ferrous	Topic not applicable to this Part 66 syllabus	0	0	0	Repair & inspection procedures for ferrous materials, structures, & airframes.	0	2	1
6.2a	Aircraft Materials Non-Ferrous	Characteristics, properties & identification of common non-ferrous materials used in aircraft; Heat treatment & application of non-ferrous materials.	1	2	1	Characteristics, properties & identification of common non-ferrous materials used in aircraft; Heat treatment & application of non-ferrous materials.	1	2	1
6.2b	Aircraft Materials Non-Ferrous	Testing of non-ferrous material for hardness, tensile strength, fatigue strength & impact resistance.	0	1	1	Testing of non-ferrous material for hardness, tensile strength, fatigue strength & impact resistance.	0	1	1
6.2c	Aircraft Materials Non-Ferrous	Topic not applicable to this Part 66 syllabus	0	0	0	Repair & inspection procedures for non-ferrous materials, structures, & airframes.	0	2	1
6.3.1a	Aircraft Materials Composite & non-metallic other than wood & fabric	Characteristics, properties & identification of common composite & non-metallic materials, other than wood, used in aircraft; Sealant & bonding agents.	1	2	2	Characteristics, properties & identification of common composite & non-metallic materials, other than wood, used in aircraft; Sealant & bonding agents.	1	2	2
6.3.1b	Aircraft Materials Composite & non-metallic other than wood & fabric	The detection of defects/deterioration in composite & non-metallic material; Repair of composite & non-metallic material.	1	2	0	Detection of defects/deterioration in composite & non-metallic materials.	1	2	0
6.3.1c	Aircraft Materials Composite & non-metallic other than wood & fabric	Topic not applicable to this Part 66 syllabus	0	0	0	Repair of & inspection procedures for composite & non-metallic materials, structures, & airframes.	0	2	1

6.3.2	Aircraft Materials Wooden structures	Construction methods of wooden airframe structures; Characteristics, properties & types of wood & glue used in aeroplanes; Preservation & maintenance of wooden structures; Types of defects in wood material & wooden structures; The detection of defects in wooden structures; Repair of wooden structures.	1	2	0	Construction methods of wooden airframe structures; Characteristics, properties & types of wood & glue used in aeroplanes; Preservation & maintenance of wooden structures; Types of defects in wood material & wooden structures; The detection of defects in wooden structures; Repair of wooden structures.	1	1	0
6.3.3	Aircraft Materials Fabric covering	Characteristics, properties & types of fabrics used in aeroplanes; Inspections methods for fabrics; Types of defects in fabrics; Repair of fabric covering.	1	2	0	Characteristics, properties & types of fabrics used in aeroplanes; Inspections methods for fabrics; Types of defects in fabrics; Repair of fabric covering.	0	1	0
6.4a	Corrosion	Chemical fundamentals; Formation by, galvanic action process, microbiological, stress;	1	1	1	Chemical fundamentals; Formation by galvanic action process, microbiological contamination, mechanical stress.	1	1	1
6.4b	Corrosion	Types of corrosion & their identification; Causes of corrosion; Material types, & their susceptibility to corrosion.	2	3	2	Types of corrosion & their identification; Causes of corrosion; Material types, & their susceptibility to corrosion.	2	3	2
6.5.1	Fasteners Screw threads	Screw nomenclature; Thread forms, dimensions & tolerances for standard threads used in aircraft; Measuring screw threads.	2	2	2	Screw nomenclature; Thread forms, dimensions & tolerances for standard threads used in aircraft; Measuring screw threads.	2	2	2
6.5.2	Fasteners Bolts, studs & screws	Bolt types: specification, identification & marking of aircraft bolts, international standards; Nuts: self-locking, anchor, standard types; Machine screws: aircraft specifications; Studs: types & uses, insertion, & removal; Self-tapping screws, dowels.	2	2	2	Bolt types: specification, identification & marking of aircraft bolts, international standards; Nuts: self-locking, anchor, standard types; Machine screws: aircraft specifications; Studs: types & uses, insertion, & removal; Self-tapping screws, dowels.	2	2	2
6.5.3	Fasteners Locking devices	Tab & spring washers, locking plates, split pins, pal-nuts, wire locking, quick-release fasteners, keys, circlips, cotter pins.	2	2	2	Tab & spring washers, locking plates, split pins, pal-nuts, wire locking, quick-release fasteners, keys, circlips, cotter pins.	2	2	2
6.5.4	Fasteners Aircraft rivets	Types of solid & blind rivets: specifications & identification, heat treatment.	1	2	1	Types of solid & blind rivets: specifications & identification, heat treatment.	1	2	1
6.6a	Pipes & Unions	Identification of, & types of rigid & flexible pipes & their connectors used in aircraft;	2	2	2	Identification of, & types of rigid & flexible pipes & their connectors used in aircraft;	2	2	2
6.6b	Pipes & Unions	Standard unions for aircraft hydraulic, fuel, oil, pneumatic & air system pipes.	2	2	1	Standard unions for aircraft hydraulic, fuel, oil, pneumatic & air system pipes.	2	2	1
6.7	Springs	Types of springs, materials, characteristics, & applications.	0	2	1	Types of springs, materials, characteristics, & applications.	0	2	1
6.8	Bearings	Purpose of bearings, loads, material, construction; Types of bearings & their application.	1	2	2	Purpose of bearings, loads, material, construction; Types of bearings & their application.	1	2	2
6.9	Transmissions	Gear types & their application; Gear ratios, reduction & multiplication gear systems, driven & driving gears, idler gears, mesh patterns; Belts & pulleys, chains & sprockets.	1	2	2	Gear types & their application; Gear ratios, reduction & multiplication gear systems, driven & driving gears, idler gears, mesh patterns; Belts & pulleys, chains & sprockets.	1	2	2
6.10	Control Cables	Types of cables; End fittings, turnbuckles & compensation devices; Pulleys & cable system components; Bowden cables; Aircraft flexible control systems.	1	2	1	Types of cables; End fittings, turnbuckles & compensation devices; Pulleys & cable system components; Bowden cables; Aircraft flexible control systems.	1	2	1
6.11	Electrical Cables & Connectors	Cable types, construction & characteristics; High-tension & co-axial cables; Crimping; Connector types, pins, plugs, sockets, insulators, current & voltage rating, coupling, identification codes.	1	2	2	Cable types, construction & characteristics; High-tension & co-axial cables; Crimping; Connector types, pins, plugs, sockets, insulators, current & voltage rating, coupling, identification codes.	1	2	2
7.1	Safety precautions - aircraft & workshop	Aspects of safe working practices including precautions to take when working with electricity, gases especially oxygen, oils & chemicals. Also, 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.	3	3	3	Aspects of safe working practices including precautions to be taken when working with electricity, gases (especially oxygen), oils, & chemicals. Fuel tank safety & fuel tank entry procedures & precautions. Awareness & precautions regarding aircraft equipped with ballistic recovery systems. Also, instructions for the remedial action to be taken in the event of a fire or another accident with one or more of these hazards, including information on fire-extinguishing agents.	3	3	3
7.2	Workshop practices	Care of tools, control of tools, use of workshop materials; Dimensions, allowances & tolerances, workmanship standards; Calibration of tools & equipment, calibration standards.	3	3	3	Care of tools, control of tools, use of workshop materials; Dimensions, allowances & tolerances, workmanship standards; Calibration of tools & equipment, calibration standards.	3	3	3
7.3	Tools	Common hand-tool types; Common power-tool types; Operation & use of precision-measuring tools; Lubrication equipment & methods; Operation, function, & use of electrical general test equipment.	3	3	3	Common hand-tool types; Common power-tool types; Operation & use of precision-measuring tools; Lubrication equipment & methods; Operation, function, & use of electrical general test equipment.	3	3	3
7.4	Avionic General Test Equipment	Operation, function & use of avionic general test equipment.	0	2	3	This topic is now covered in Modules 11A (11.5.2) & Module 13 (13.8)	0	0	0
7.5	Engineering drawings, diagrams, & standards	Drawing types & diagrams, their symbols, dimensions, tolerances & projections; Identification of title block information; Microfilm, microfiche, & computerised presentations; Specification 100 of the Air Transport Association (ATA) of America; Aeronautical & other applicable standards including ISO, AN, MS, NAS & MIL; Wiring diagrams & schematic diagrams.	1	2	2	Drawing types & diagrams, their symbols, dimensions, tolerances & projections; Identification of title block information; Microfilm, microfiche, & computerised presentations; Specification 100 of the Air Transport Association (ATA) of America; Aeronautical & other applicable standards including ISO, AN, MS, NAS & MIL; Wiring diagrams & schematic diagrams.	1	2	2

7.6	Fits & clearances	Drill sizes for bolt holes, classes of fits; Common system for fits & clearances; Schedule of fits & clearances for aircraft & engines; Limits for bow, twist & wear; Standard methods for checking shafts, bearings, & other parts.	1	2	1	Drill sizes for bolt holes, classes of fits; Common system for fits & clearances; Schedule of fits & clearances for aircraft & engines; Limits for bow, twist & wear; Standard methods for checking shafts, bearings, & other parts.	1	2	1
7.7	Electrical wiring interconnection system (EWIS)	Continuity, insulation & bonding techniques & testing; Use of crimp tools: hand & hydraulic operated; Testing of crimp joints; Connector pin removal & insertion; Co-axial cables: testing & installation precautions; Identification of wire types, their inspection criteria & damage tolerance. Wiring protection techniques: Cable looming & loom support, cable clamps, protective sleeving techniques including heat shrink wrapping, shielding; EWIS installations, inspection, repair, maintenance & cleanliness standards.	1	3	3	Continuity, insulation & bonding techniques & testing; Use of crimp tools: hand & hydraulic operated; Testing of crimp joints; Connector pin removal & insertion; Coaxial cables: testing & installation precautions; Identification of wire types, their inspection criteria & damage tolerance; Wiring protection techniques: cable looming & loom support, cable clamps, protective sleeving techniques including heat shrink wrapping, shielding; High-Intensity Radiated Fields (HIRF) & protection principles ; Soldering of electrical wires , EWIS installations, inspection, repair, maintenance, & cleanliness standards.	1	3	3
7.8	Riveting	Riveted joints, rivet spacing & pitch; Tools used for riveting & dimpling; Inspection of riveted joints.	1	2	0	Riveted joints, rivet spacing & pitch; Tools used for riveting & dimpling; Inspection of riveted joints.	1	2	0
7.9	Pipes & hoses	Bending & beelling/flaring aircraft pipes; Inspection & testing of aircraft pipes & hoses; Installation & clamping of pipes.	1	2	0	Bending & beelling/flaring aircraft pipes; Inspection & testing of aircraft pipes & hoses; Installation & clamping of pipes.	1	2	0
7.10	Springs	Inspection & testing of springs.	1	2	0	Inspection & testing of springs.	1	2	0
7.11	Bearings	Testing, cleaning & inspection of bearings; Lubrication requirements for bearings; Defects in bearings & their causes.	1	2	0	Testing, cleaning & inspection of bearings; Lubrication requirements for bearings; Defects in bearings & their causes.	1	2	0
7.12	Transmissions	Inspection of gears, backlash; Inspection of belts & pulleys, chains & sprockets; Inspection of screw jacks, lever devices, push-pull rod systems.	1	2	0	Inspection of gears, backlash; Inspection of belts & pulleys, chains & sprockets; Inspection of screw jacks, lever devices, push-pull rod systems.	1	2	0
7.13	Control cables	Swaging of end fittings; Inspection & testing of control cables; Bowden cables; aircraft flexible control systems.	1	2	0	Swaging of end fittings; Inspection & testing of control cables; Bowden cables; aircraft flexible control systems.	1	2	0
7.14.1	Material handling Sheet metal	Marking out & calculation of bend allowance; Sheet metal working, including bending & forming; Inspection of sheet metal work.	0	2	0	Marking out & calculation of bend allowance; Sheet metal working, including bending & forming; Inspection of sheet metal work.	0	2	0
7.14.2	Material handling Composite & non-metallic	Bonding practices; Environmental conditions; Inspection methods.	0	2	0	Bonding practices; Environmental conditions; Inspection methods.	0	2	0
7.14.3	Material handling Additive manufacturing	Topic not applicable to this Part 66 syllabus	0	0	0	Common additive manufacturing techniques & their influence on the mechanical properties of the finished part; Inspection of additive manufactured parts & common production failures.	1	1	1
7.15a	Welding, Brazing, Soldering & Bonding	Soldering methods; inspection of soldered joints.	0	2	2	Topic not applicable to this Part 66 syllabus	0	0	0
7.15b	Welding, Brazing, Soldering & Bonding	Welding & brazing methods; Inspection of welded & brazed joints; Bonding methods & inspection of bonded joints.	0	2	0	Topic not applicable to this Part 66 syllabus	0	0	0
7.16a	Aircraft weight & balance	Calculation of centre-of-gravity / balance limits: use of relevant documents.	0	2	2	Calculation of centre-of-gravity / balance limits: use of relevant documents.	0	2	2
7.16b	Aircraft weight & balance	Preparation of aircraft for weighing; Aircraft weighing.	0	2	0	Preparation of aircraft for weighing; Aircraft weighing.	0	2	0
7.17	Aircraft handling & storage	Aircraft taxiing/towing & associated safety precautions; Aircraft jacking, chocking, securing & associated safety precautions; Aircraft storage methods; Refuelling/defuelling procedures; De-icing/anti-icing procedures; Electrical, hydraulic, & pneumatic ground supplies; Effects of environmental conditions on aircraft handling & operation.	2	2	2	Aircraft taxiing/towing & associated safety precautions; Aircraft jacking, chocking, securing & associated safety precautions; Aircraft storage methods; Refuelling/defuelling procedures; De-icing/anti-icing procedures; Electrical, hydraulic, & pneumatic ground supplies; Effects of environmental conditions on aircraft handling & operation.	2	2	2
7.18a	Disassembly, inspection, repair, & assembly techniques	Types of defects & visual inspection techniques; Corrosion removal, assessment & re-protection;	2	3	3	Types of defects & visual inspection techniques; Corrosion removal, assessment & re-protection;	2	3	3
7.18b	Disassembly, inspection, repair, & assembly techniques	General repair methods, structural repair manual; Ageing, fatigue, & corrosion control programmes;	0	2	0	General repair methods, structural repair manual; Ageing, fatigue, & corrosion control programmes;	0	2	0
7.18c	Disassembly, inspection, repair, & assembly techniques	Non-destructive inspection techniques including, penetrant, radiographic, eddy current, ultrasonic & borescope methods;	0	2	1	Non-destructive inspection techniques including penetrant, radiographic, eddy current, magnetic particle, ultrasonic & borescope inspections; including practical training in colour contrast penetrant inspection ;	0	2	1
7.18d	Disassembly, inspection, repair, & assembly techniques	Disassembly & re-assembly techniques;	2	2	2	Disassembly & re-assembly techniques;	2	2	2
7.18e	Disassembly, inspection, repair, & assembly techniques	Troubleshooting techniques.	0	2	2	Troubleshooting techniques.	0	2	2
7.19a	Abnormal events	Inspections following lightning strikes & HIRF penetration;	2	2	2	Inspections following lightning strikes & HIRF penetration;	2	2	2

7.19b	Abnormal events	Inspections following abnormal events such as heavy landings & flight through turbulence.	2	2	0	Inspections following abnormal events such as heavy landings & flight through turbulence.	2	2	0
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.	1	2	2	Maintenance planning; Modification procedures; Stores procedures; Certification/release procedures; Interface with aircraft operation; Maintenance Inspection / Quality Control / Quality Assurance; Additional maintenance procedures; Control of life-limited components.	1	2	2
7.21	Documentation & communication	Topic not applicable to this Part 66 syllabus				Documentation: elements and criteria for writing work reports, troubleshooting reports, and shift handover instructions. Communication: clear, comprehensive, and concise.	1	2	2
8.1	Physics of the atmosphere	International Standard Atmosphere (ISA), & its application to aerodynamics.	1	2	2	International Standard Atmosphere (ISA), & its application to aerodynamics.	1	2	2
8.2	Aerodynamics	Airflow around a body; Boundary layer, laminar & turbulent flow, free stream flow, relative airflow, upwash & downwash, vortices, stagnation; The terms: camber, chord, mean aerodynamic chord, profile (parasite) drag, induced drag, centre of pressure, angle of attack, wash-in & wash-out, fineness ratio, wing shape & aspect ratio; Thrust, weight, aerodynamic resultant; Generation of lift & drag: angle of attack, lift coefficient, drag coefficient, polar curve, stall; Aerofoil contamination including ice, snow, & frost.	1	2	2	Airflow around a body; Boundary layer, laminar & turbulent flow, free stream flow, relative airflow, upwash & downwash, vortices, stagnation; The terms: camber, chord, mean aerodynamic chord, profile (parasite) drag, induced drag, centre of pressure, angle of attack, wash-in & wash-out, fineness ratio, wing shape & aspect ratio; Thrust, weight, aerodynamic resultant; Generation of lift & drag: angle of attack, lift coefficient, drag coefficient, polar curve, stall; Aerofoil contamination including ice, snow, & frost.	1	2	2
8.3	Theory of flight	Relationship between lift, weight, thrust & drag; Glide ratio; Steady-state flights, performance; Theory of the turn; Influence of load factor: stall, flight envelope, & structural limitations; Lift augmentation.	1	2	2	Relationship between lift, weight, thrust & drag; Glide ratio; Steady-state flights, performance; Theory of the turn; Influence of load factor: stall, flight envelope, & structural limitations; Lift augmentation.	1	2	2
8.4/8.5	High-speed airflow	Topic not applicable to this Part 66 syllabus. However this topic is covered in Module 11A (11.1.2).	0	0	0	Speed of sound, subsonic flight, transonic flight, supersonic flight, Mach number, critical Mach number, compressibility buffet, shock wave, aerodynamic heating, area rule; Factors that affect airflow in engine intakes of high-speed aircraft; Effects of sweepback on critical Mach number.	1	2	2
8.4/8.5	Flight stability & dynamics	Longitudinal, lateral, & directional stability (active & passive).	1	2	2	Longitudinal, lateral, & directional stability (active & passive).	1	2	2
9.1	General	The need to take human factors into account when performing maintenance; Incidents attributable to human factors/human error; 'Murphy's' law.	1	2	2	The need to take human factors into account when performing maintenance; Incidents attributable to human factors/human error; 'Murphy's' law.	2	2	2
9.2	Human performance & limitations	Vision; Hearing; Information processing; Attention & perception; Memory; Claustrophobia & physical access.	1	2	2	Vision; Hearing; Information processing; Attention & perception; Memory; Claustrophobia & physical access.	2	2	2
9.3	Social psychology	Accountability & responsibility: individual & group; Motivation & de-motivation; Peer pressure; Cultural issues; Teamwork; Management, supervision, & leadership.	1	1	1	Accountability & responsibility: individual & group; Motivation & de-motivation; Peer pressure; Cultural issues; Teamwork; Management, supervision, & leadership.	1	1	1
9.4	Factors that affect performance	Fitness/health; Stress: domestic & work related; Time pressure & deadlines; Workload: overload & underload; Sleep & fatigue, shiftwork; Alcohol, medication, drug abuse.	2	2	2	Fitness/health; Stress: domestic & work related; Time pressure & deadlines; Workload: overload, underload, & workload management; Sleep & fatigue, shift work; Alcohol, medication, drug abuse; Lack of manpower.	2	2	2
9.5	Physical environment	Noise & fumes; Illumination; Climate & temperature; Motion & vibration; Working environment.	1	1	1	Noise & fumes; Illumination; Climate & temperature; Motion & vibration; Working environment; Situational awareness.	1	1	1
9.6	Tasks	Physical work; Repetitive tasks; Visual inspection; Complex systems.	1	1	1	Physical work; Repetitive tasks, complacency; Visual inspection; Complex systems; Critical maintenance tasks & error-capturing methods; Technical documentation: access, use, & quality.	1	1	1

9.7	Communication	Within & between teams; Work logging & recording; Keeping up to date, currency; Dissemination of information.	2	2	2	Within & between teams; Work logging & recording; Shift handover ; Keeping up to date, currency; Dissemination of information.	2	2	2
9.8	Human error	Error models & theories; Types of error in maintenance tasks; Implications of errors (i.e. accidents); Avoiding & managing errors.	1	2	2	Error models & theories; Types of error in maintenance tasks; Implications of errors (e.g. accidents); Organisational errors ; Avoiding & managing errors.	2	2	2
9.9	Hazards in the Workplace / Safety Management	Recognising & avoiding hazards; Dealing with emergencies.	1	2	2	Risk management ; Occurrence reporting ; Safety culture Just culture ; Identifying, avoiding, & reporting hazards; Organisational human-factors programme: professionalism & integrity, error-provoking behaviour, reporting errors, disciplinary policy, error investigation, action to address problems, feedback, assertiveness ; Dealing with emergencies.	2	2	2
9.10	The 'Dirty Dozen' & risk- mitigation	Topic not applicable to this Part 66 syllabus.	0	0	0	The 'Dirty Dozen': the twelve most common human-factors errors in maintenance: Lack of communication, Lack of teamwork, Lack of assertiveness, Complacency, Fatigue, Stress, Lack of knowledge, Lack of resources, Lack of awareness, Distraction, Pressure, Norms. Risk-mitigation methods.	2	2	2
10.1	Regulatory framework	Role of the International Civil Aviation Organisation; Role of the European Commission; Role of EASA; Role of the Member States & National Aviation Authorities; Regulations (EU) 2018/1139, Regulation (EU) No 748/2012, Regulation (EU) No 1321/2014 & Regulation (EU) No 376/2014; Relation between the various Annexes (Parts) of Regulation (EU) No 748/2012, Regulation (EU) No 1321/2014 & Regulation (EU) No 965/2012	1	1	1	Role of: — the International Civil Aviation Organization (ICAO); — the European Commission (EC); — the European Union Aviation Safety Agency (EASA); — the European Union Member States & national aviation authorities; — the bilateral agreements concluded by the European Commission; — Regulation (EU) 2018/1139 (the Basic Regulation) & its implementing acts: Regulations (EU) No 748/2012 (Initial Airworthiness) & (EU) No 1321/2014 (Continuing Airworthiness); — the relationship between regulations (hard law) & AMC, GM & CSs (soft law); — occurrence reporting according to Regulation (EU) No 376/2014; — the relationship between the various annexes (parts) relating to Initial & Continuing Airworthiness (such as Part 21, Part-M, Part-145, Part-66, Part-147, Part-T, Part-ML, Part-CAMO, & Part-CAO) & Regulations (EU) No 965/2012 (the Air Operations Regulation) & (EU) No 1178/2011 (the Air Crew Regulation).	1	1	1
10.2	Certifying staff - maintenance	Detailed understanding of Part-66.	2	2	2	Deep understanding of Part-66 maintenance licences with the associated privileges & authorisations, & how to exercise them properly for the different aircraft categories.	2	2	2
10.3	Approved maintenance organisations	Detailed understanding of Part-145 & Part-M Subpart F.	2	2	2	General understanding of Part-145 & Part-CAO.	2	2	2
10.4	Independent certifying staff	Topic not applicable to this Part 66 syllabus.	0	0	0	Privileges, responsibilities, record-keeping, limitations, & oversight according to Part-M, Part-66 & Part-ML.	0	3	3
10.4/10.5	Air operations	General understanding of Regulation (EU) No 965/2012. Air Operators Certificates; Operator's responsibilities, in particular regarding continuing airworthiness & maintenance; Aircraft Maintenance Programme; MEL/CDL; Documents to be carried on board; Aircraft placarding (markings).	1	1	1	General understanding of Regulation (EU) No 965/2012 (the Air Operations Regulation); Differences between commercial & non-commercial air operations, & their influence on aircraft maintenance; Air Operator Certificates (AOCs) & self-declaration authorisations; Air operator responsibilities, in particular regarding continuing airworthiness & maintenance; Specialised operations / specific approvals: ETOPS, CAT I/II/III, & BRNAV. Minimum Equipment List (MEL) & Configuration Deviation List (CDL); Aircraft placarding & markings; Documents to be carried on board: — Certificate of Airworthiness / Restricted Certificate of Airworthiness; — Airworthiness Review Certificate; — Permit to Fly; — Certificate of Registration; — Noise Certificate; — Weight & Balance report; — Radio Station Licence.	1	1	1
10.5b/10.6	Certification of aircraft, parts, & appliances	Documents Certificate of Airworthiness; restricted certificates of airworthiness & permit to fly; Certificate of Registration; Noise Certificate; Weight Schedule; Radio Station Licence & Approval.	0	1	1		1	1	1
10.5a/10.6	Certification of aircraft, parts, & appliances	General General understanding of Part 21 & EASA certification specifications CS-23, 25, 27, 29.	0	1	1	Basic understanding of Part 21 & of the following EASA certification specifications: CS-22, CS-23, CS-25, CS-27, CS-29, & CS-STAN.	2	2	2
10.6/10.7	Continuing airworthiness	Detailed understanding of Part 21 provisions related to continuing airworthiness. Detailed understanding of Part-M.	2	2	2	General understanding of the Part 21 requirements on continuing airworthiness; General understanding of Part-M, Part-ML & Part-CAMO; Aircraft Maintenance Programme .	2	2	2
10.8	Oversight principles in continuing airworthiness	Topic not applicable to this Part 66 syllabus.	0	0	0	Oversight principles in continuing airworthiness	1	1	1

10.7a/10.9	Applicable National & International Requirements for (if not superseded by EU requirements). / Maintenance & certification beyond current EU regulations (if not superseded by EU requirements)	Maintenance Programmes, Maintenance checks & inspections; Airworthiness Directives; Service Bulletins, manufacturers service information; Modifications & repairs; Maintenance documentation: maintenance manuals, structural repair manual, illustrated parts catalogue, etc.; Only for A to B2 licences: Master Minimum Equipment Lists, Minimum Equipment List, Dispatch Deviation Lists;	1	2	2	Maintenance of European Union aircraft that are not within the scope of Regulation (EU) 2018/1139 (Annex I aircraft); European military airworthiness requirement (EMAR) 66 licence; Applicable national & international requirements for component maintenance, welding, painting, NDT, etc. (if not superseded by EU requirements).	0	1	1
10.7b	Applicable National & International Requirements for (if not superseded by EU requirements).	Continuing airworthiness; Minimum equipment requirements — Test flights; Only for B1 & B2 licences: ETOPS, maintenance & dispatch requirements; All Weather Operations, Category 2/3 operations.	0	1	1				
10.10	Cybersecurity in aviation maintenance	Topic not applicable to this Part 66 syllabus.	0	0	0	Regulation on the introduction of organisation requirements for the management of information security risks related to aeronautical information systems used in civil aviation.	1	1	1
11.1.1/11.1a	Theory of flight Aeroplane Aerodynamics & Flight Controls	Operation & effect of: — roll control: ailerons & spoilers, — pitch control: elevators, stabilators, variable incidence stabilisers & 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 & effect of trim tabs, balance & antibalance (leading) tabs, servo tabs, spring tabs, mass balance, control surface bias, aerodynamic balance panels.	1	2		Operation & effect of: — roll control: ailerons & spoilers; — pitch control: elevators, stabilators, variable incidence stabilisers & canards; — yaw control, rudder limiters; — elevons, ruddervators; — high-lift devices, slots, slats, flaps, flaperons; — drag-inducing devices, spoilers, lift dumpers, speed brakes; — trim tabs, servo tabs, control surface bias.	1	2	
11.1b	Theory of flight Aeroplane: other aerodynamic devices		1	2		Operation & effect of: — balance & antibalance (leading) tabs; — spring tabs, mass balance, aerodynamic balance panels; — mass balance, aerodynamic balance panels; — effects of wing fences, saw tooth leading edges; — boundary layer control using vortex generators, stall wedges or leading-edge devices.	1	2	
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.	1	2		Topic not applicable to this Part 66 syllabus. However this topic is covered in Module 8 (8.4).	0	0	
11.2a	Airframe Structures (ATA 51) General Concepts	Airworthiness requirements for structural strength; Structural classification, primary, secondary & tertiary; Fail safe, safe life, damage tolerance concepts; Zonal & station identification systems;				— Zonal & station identification systems; — Electrical bonding; — Lightning strike protection provisions.	2	2	
11.2b	Airframe Structures (ATA 51) Airworthiness requirements for structural strength:	Stress, strain, bending, compression, shear, torsion, tension, hoop stress, fatigue; Drains & ventilation provisions; System installation provisions; Lightning strike protection provision; Aircraft bonding.	2	2		— Structural classification: primary, secondary, & tertiary; — Fail-safe, safe-life, damage-tolerance concepts; — Stress, strain, bending, compression, shear, torsion, tension, hoop stress, fatigue; — Drains & ventilation provisions; — System installation provisions.	2	2	
11.2b/11.2c	Airframe Structures - General Concepts/Construction Methods	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 & engine attachments; Structure assembly techniques: riveting, bolting, bonding; Methods of surface protection, such as chromating, anodising, painting; Surface cleaning; Airframe symmetry: methods of alignment & symmetry checks.	1	2		— Stressed skin fuselage, formers, stringers, longerons, bulkheads, frames, doublers, struts, ties, beams, floor structures, reinforcement, skinning, anticorrosive protection, wing, empennage & engine attachments; — Structure assembly techniques: riveting, bolting, bonding; — Methods of surface protection, such as chromating, anodising, painting; — Surface cleaning; — Airframe symmetry: methods of alignment & symmetry checks.	1	2	
11.3.1/11.3.1a	Airframe Structures - Aeroplanes Fuselage (ATA 52/53/56)/Fuselage, doors, windows (ATA 52/53/56) Construction Principles	Construction & pressurisation sealing; Wing, stabiliser, pylon & undercarriage attachments; Seat installation & cargo loading system; Doors & emergency exits: construction, mechanisms, operation & safety devices; Windows & windscreen construction & mechanisms.	1	2		— Construction & pressurisation sealing; — Wing, stabiliser, pylon, & undercarriage attachments; — Seat installation & cargo loading system; — Doors & emergency exits: construction, mechanisms, operation & safety devices; — Windows & windscreen construction & mechanisms.	1	2	
11.3.1c	Airframe Structures - Aeroplanes Fuselage, doors, windows (ATA 52/53/56) Doors					— Doors & emergency exits: safety devices; — Cargo loading system.	1	2	
11.3.1b	Airframe Structures - Aeroplanes Fuselage, doors, windows (ATA 52/53/56)	Topic not applicable to this Part 66 syllabus.	0	0		Airborne towing devices (glider, banner, target).	1	1	
11.3.2	Airframe Structures - Aeroplanes Wings (ATA 57)	Construction; Fuel storage; Landing gear, pylon, control surface & high lift/drag attachments.	1	2		Construction; Fuel storage; Landing gear, pylon, control surface & high lift/drag attachments.	1	2	
11.3.3	Airframe Structures - Aeroplanes Stabilisers (ATA 55)	Construction; Control surface attachment.	1	2		Construction; Control surface attachment.	1	2	

11.3.4	Airframe Structures - Aeroplanes Flight Control Surfaces (ATA 55/57)	Construction & attachments; Balancing — mass & aerodynamics.	1	2	Construction & attachments; Balancing — mass & aerodynamics.	1	2
11.3.5	Airframe Structures - Aeroplanes Nacelles/Pylons (ATA 54)	Nacelles/Pylons: — Construction, — Firewalls, — Engine mounts.	1	2	Nacelles/Pylons: — Construction, — Firewalls, — Engine mounts.	1	2
11.4.1/11.4b	Air Conditioning & Cabin Pressurisation (ATA 21) Air supply	Sources of air supply including engine bleed, APU & ground cart.	1	2	Sources of air supply including engine bleed, APU & ground cart; Distribution systems.	1	3
11.4.2/11.4c	Air Conditioning & Cabin Pressurisation (ATA 21) Air Conditioning	Air conditioning systems; Air cycle & vapour cycle machines; Distribution systems; Flow, temperature & humidity control system.	1	3	Air-conditioning systems; Air cycle & vapour cycle machines; Flow, temperature & humidity control system; Control & indication control valves.	1	3
11.4.3/11.4a	Air Conditioning & Cabin Pressurisation (ATA 21) Pressurisation	Pressurisation systems; Control & indication including control & safety valves; Cabin pressure controllers.	1	3	Pressurisation systems; Cabin pressure controllers, control, & safety valves; Control & indication.	1	3
11.4.4/11.4d	Air Conditioning & Cabin Pressurisation (ATA 21) Safety & warning devices	Protection & warning devices.	1	3	Protection & warning devices.	1	3
11.5.1	Instrument Systems (ATA 31)	Pitot static: altimeter, air speed indicator, vertical speed indicator; Gyroscopic: artificial horizon, attitude director, direction indicator, horizontal situation indicator, turn & slip indicator, turn coordinator; Compasses: direct reading, remote reading; Angle of attack indication, stall warning systems; Glass cockpit; Other aircraft system indication.	1	2	Pitot-static: Airspeed indicators, Vertical speed indicators, Altimeters; Gyroscopic: Gyroscopic principles, Artificial horizons, Attitude directors, Direction indicators, Horizontal situation indicators (HSI), Slip indicators, Turn indicators, Turn coordinators; Compass systems: systems, direct reading, remote reading, Stall-warning systems & angle-of-attack indicating systems, Glass cockpit, Indications of other aircraft systems.	1	2
11.5.2	Avionic Systems	Fundamentals of system lay-outs & operation of: — Auto Flight (ATA 22), — Communications (ATA 23), — Navigation Systems (ATA 34).	1	1	Fundamentals of system layouts & operation of: Autoflight (ATA 22); Communication systems (ATA 23): — Very High Frequency (VHF) communications, — High Frequency (HF) communications, — Satellite Communications (SATCOM), — Controller-pilot data link communications (CPDLC), — Audio systems, — Emergency Locator Transmitters (ELTs), — Cockpit Voice Recorder (CVR); Navigation systems (ATA 34): — Very high frequency omnidirectional range (VOR), — Automatic direction finder (ADF), — Instrument landing system (ILS), — Microwave landing system (MLS), — Flight director systems (FDSs), distance-measuring equipment (DME), — Area navigation (RNAV) systems, — Flight management systems (FMSs), — Satellite navigation systems, — Air traffic control transponder, secondary surveillance radar, — Traffic alert & collision avoidance system (TCAS), — Weather avoidance radar, — Radio altimeter, — Inertial navigation system (INS), — ARINC (Aeronautical Radio Incorporated) communication & reporting. Types & uses of avionics general test equipment.	1	1
11.6	Electrical Power (ATA 24)	— Installation & operation of batteries; — DC power generation; — AC power generation; — Emergency power generation; — Voltage regulation; — Power distribution; — Inverters, transformers, rectifiers; — Circuit protection; — External/Ground power.	1	3	— Installation & operation of batteries; — DC power generation; — AC power generation; — Emergency power generation; — Voltage regulation; — Power distribution; — Inverters, transformers, rectifiers; — Circuit protection; — External/ground power.	1	3
11.7a	Equipment & Furnishings (ATA 25) Emergency Equipment	Emergency equipment requirements; Seats, harnesses & belts.	2	2	Emergency equipment: Emergency equipment requirements.	2	2
11.7b	Equipment & Furnishings (ATA 25) Cabin & Cargo Layout	Cabin lay-out; Equipment lay-out; Cabin Furnishing installation; Cabin entertainment equipment; Galley installation; Cargo handling & retention equipment; Airstairs.	1	1	— Seats, harnesses, & belts; — Cabin layout; — Equipment layout; — Cabin furnishing installation; — Galley installation; — Cargo handling & retention equipment; — Airstairs.	1	1
11.8a	Fire Protection (ATA 26)	Fire & smoke detection & warning systems; Fire extinguishing systems; System tests;	1	3	Fire & smoke detection system, & fire-extinguishing systems: — Fire & smoke detection & warning systems; — Fire-extinguishing systems; — System tests.	1	1
11.8b	Fire Protection (ATA 26)	Portable fire extinguisher.	1	2	(NOTE PRE-989 B1.1 LEVEL 3: THIS LEVEL 1 COULD BE A TYPO. AEv.) Portable fire extinguisher.	1	1

11.9/11.9a	Flight Controls (ATA 27) Primary & secondary flight controls:	Primary controls: aileron, elevator, rudder, spoiler; Trim control; Active load control; High lift devices; Lift dump, speed brakes; System operation: manual, hydraulic, pneumatic, electrical, fly-by-wire; Artificial feel, Yaw damper, Mach trim, rudder limiter, gust lock systems;	1	3	— Primary controls: aileron, elevator, rudder, spoiler; — Trim control, trim tabs; — High-lift devices; — System operation: manual; — Gust locks & gust lock systems; — Artificial feel, yaw damper, Mach trim, rudder limiter; — Stall-warning systems.	1	3
11.9b	Flight Controls (ATA 27) Actuation & protection:	Balancing & rigging; Stall protection/warning system.	1	3	— Active load control; — Lift dump, speed brakes; — Hydraulic, pneumatic systems; — Stall-protection systems.	1	3
11.9c	Flight Controls (ATA 27) System operation:		1	3	Electrical systems, fly-by-wire systems.	1	3
11.9d	Flight Controls (ATA 27) Balancing & rigging.		1	3	Balancing & rigging.	1	3
11.10/11.10a	Fuel Systems (ATA 28) Systems	System lay-out; Fuel tanks; Supply systems; Dumping, venting & draining; Cross-feed & transfer; Indications & warnings; Refuelling & defuelling; Longitudinal balance fuel systems.	1	3	— System layout; — Fuel tanks; — Supply systems.	1	3
11.10b	Fuel Systems (ATA 28) Fuel handling:		1	3	— Cross-feed & transfer; — Refuelling & defuelling.	1	3
11.10c	Fuel Systems (ATA 28) Indication & warnings.		1	3	No further info given. AEv.	1	3
11.10d	Fuel Systems (ATA 28) Special systems:		1	3	— Dumping, venting, & draining; — Inert gas systems.	1	3
11.10e	Fuel Systems (ATA 28) Balancing:		1	3	Longitudinal balance fuel systems.	1	3
11.11/11.11a	Hydraulic Power (ATA 29) System description:	System lay-out; Hydraulic fluids; Hydraulic reservoirs & accumulators; Pressure generation: electric, mechanical, pneumatic; Emergency pressure generation; Filters;	1	3	System layout; Hydraulic fluids; Hydraulic reservoirs & accumulators; Filters; Power distribution.	1	3
11.11b	Hydraulic Power (ATA 29) System operation (1):	Pressure Control; Power distribution; Indication & warning systems; Interface with other systems.	1	3	Pressure generation: electric & mechanical; Pressure control; Indication & warning systems; Servicing.	1	3
11.11c	Hydraulic Power (ATA 29) System operation (2):		1	3	Pressure generation: pneumatic; Emergency pressure generation; Interface with other systems.	1	3
11.12/11.12a	Ice & Rain Protection (ATA 30) Principles:	Ice formation, classification & detection; Anti-icing systems: electrical, hot air & chemical;	1	3	Ice formation, classification, & detection.	1	3
11.12b	Ice & Rain Protection (ATA 30) De-icing:	De-icing systems: electrical, hot air, pneumatic & chemical; Rain repellent; Probe & drain heating; Wiper systems.	1	3	De-icing systems: electrical, hot-air, pneumatic, chemical; Probe & drain heating.	1	3
11.12c	Ice & Rain Protection (ATA 30) Anti-icing:		1	3	Anti-icing systems: electrical, hot-air, chemical.	1	3
11.12d	Ice & Rain Protection (ATA 30) Wipers:		1	3	Wiper systems.	1	3
11.12e	Rain-repellent systems.		1	3	Rain-repellent systems.	1	3
11.13/11.13a	Landing Gear (ATA 32) Description:	Construction, shock absorbing; Extension & retraction systems: normal & emergency, Indications & warning;	2	3	Construction, shock absorbing; Tyres.	2	3
11.13b	Landing Gear (ATA 32) Systems:	Wheels, brakes, antiskid & autobraking; Tyres; Steering; Air-ground sensing.	2	3	Extension & retraction systems: normal & emergency; Indications & warnings; Wheels, brakes, antiskid, & autobraking; Steering.	2	3
11.13c	Landing Gear (ATA 32) Air-ground sensing.		2	3	No further info given. AEv.	2	3
11.13d	Landing Gear (ATA 32) Tail protection:		2	3	Skids.	2	3
11.14	Lights (ATA 33)	External: navigation, anticollision, landing, taxiing, ice; Internal: cabin, cockpit, cargo; Emergency.	2	3	External: navigation, anticollision, landing, taxiing, ice; Internal: cabin, cockpit, cargo; Emergency.	2	3
11.15	Oxygen (ATA 35)	System lay-out: cockpit, cabin; Sources, storage, charging & distribution; Supply regulation; Indications & warnings.	1	3	System lay-out: cockpit, cabin; Sources, storage, charging & distribution; Supply regulation; Indications & warnings.	1	3

11.16/11.16a	Pneumatic/Vacuum (ATA 36) Systems:	System lay-out; Sources: engine/APU (Auxiliary Power Unit), compressors, reservoirs, ground supply; Pressure & vacuum pumps; Pressure control; Distribution; Indications & warnings; Interfaces with other systems.	1	3	System layout; Sources: engine / APU (Auxiliary Power Unit), compressors, reservoirs, ground supply; Pressure control; Distribution; Indications & warnings; Interface with other systems.	1	3
11.16b	Pneumatic/Vacuum (ATA 36)Pumps:		1	3	Pressure & vacuum pumps.	1	3
11.17/11.17a	Water/Waste (ATA 38) Systems:	Water system lay-out, supply, distribution, servicing & draining; Toilet system lay-out, flushing & servicing; Corrosion aspects.	2	3	Water system layout, supply, distribution, servicing & draining; Toilet system layout, flushing & servicing.	2	3
11.17b	Water/Waste (ATA 38) Corrosion:		2	3	Corrosion aspects.	2	3
11.18	On-Board Maintenance Systems (ATA 45)	Central maintenance computers; Data-loading system; Electronic library system; Printing systems; Structure monitoring (damage-tolerance monitoring).	1	2	Central maintenance computers; Data-loading system; Electronic library system; Printing systems; Structure monitoring (damage-tolerance monitoring).	1	2
11.19/11.19a	Integrated Modular Avionics (ATA 42) Overall system description & theory:	Functions that may be typically integrated in the Integrated Modular Avionic (IMA) modules are, among others: Bleed Management, Air Pressure Control, Air Ventilation & Control, Avionics & 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 & Retraction, Tyre Pressure Indication, Oleo Pressure Indication, Brake Temperature Monitoring, etc. Core System; Network Components.	1	2	Core system; network components; Functions that may be typically integrated in the integrated modular avionics (IMA) modules are, among others: Bleed management, air pressure control, air ventilation & control, avionics communication router, electrical load management, circuit breaker monitoring, electrical system BITE, fuel management, braking control, steering control, landing gear extension & retraction, tyre pressure indication, oleo pressure indication, brake temperature monitoring, etc.	1	2
11.19b	Integrated Modular Avionics (ATA 42) Typical system layout.		1	2	Typical system layout.	1	2
11.20	Cabin Systems (ATA 44)	The units & components which furnish a means of entertaining the passengers & providing communication within the aircraft (Cabin Intercommunication Data System (CIDS)) & between the aircraft cabin & ground stations (Cabin Network Service (CNS)). They include voice, data, music & video transmissions. CIDS provides an interface between cockpit/cabin crew & cabin systems. These systems support data exchange between the different related Line Replaceable Units (LRUs) and they are typically operated via Flight Attendant Panels (FAPs). CNS typically consists of 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. Cabin Core System; In-flight Entertainment System; External Communication System; Cabin Mass Memory System; Cabin Monitoring System; Miscellaneous Cabin System.	1	2	System architecture, operation, & control of systems for: — passenger in-flight entertainment; — communication within the aircraft (Cabin intercommunication data system (CIDS)); — communication between the aircraft cabin & ground stations; — including voice, data, music, & video transmission. CIDS interface between cockpit/cabin crew & cabin systems. Data exchange between the different related line replaceable units (LRUs). Flight attendant panels (FAPs). Cabin network server (CNS) & interfaces with 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); & — Other systems. Cabin network server (CNS) hosting functions: — Access to predeparture/departure reports; — Email/intranet/internet access; passenger database; — In-flight entertainment system; — External communication system; — Cabin mass memory system; — Cabin monitoring system; — Miscellaneous cabin system.	1	2
11.21	Information Systems (ATA 46)	The units & components which furnish a means of storing, updating & retrieving digital information traditionally provided on paper, microfilm or microfiche. Includes units that are dedicated to the information storage & retrieval function such as the electronic library mass storage & controller. Does not include units or components installed for other uses & shared with other systems, such as flight deck printer or general use display. Typical examples include Air Traffic & Information Management Systems & Network Server Systems; Aircraft General Information System; Flight Deck Information System; Maintenance Information System; Passenger Cabin Information System; Miscellaneous Information System.	1	2	System architecture, operation, & control of: — Storage & electronic library; — Updating; — Retrieving of digital information; — Air traffic & information management systems (ATIMS) & network server systems; — Aircraft general information system; — Flight deck information system; — Maintenance information system; — Passenger cabin information system; — Miscellaneous information systems; — Other linked systems.	1	2

13.1a	Theory of Flight - Aeroplane Aerodynamics & Flight Controls	Operation & effect of: — roll control: ailerons & spoilers; — pitch control: elevators, stabilators, variable incidence stabilisers & canards; & — yaw control: rudder limiters; Control using elevons, ruddervators; High lift devices: slots, slats, flaps; Drag inducing devices: spoilers, lift dumpers, speed brakes; & Operation & effect of trim tabs, servo tabs & control surface bias.	1	Operation & effect of: — roll control: ailerons & spoilers; — pitch control: elevators, stabilators, variable incidence stabilisers & canards; & — yaw control: rudder limiters; — control using elevons, ruddervators; — high-lift devices: slots, slats, flaps; — drag-inducing devices: spoilers, lift dumpers, speed brakes; — trim tabs, servo tabs, & control surface bias.	1
13.1b	Theory of Flight - High Speed Flight	Speed of sound, subsonic flight, transonic flight, supersonic flight; Mach number, critical Mach number.	1	Topic not applicable to this Part 66 syllabus. However this topic is covered in Module 8 (8.4).	0
13.1c	Theory of Flight - Rotary Wing Aerodynamics	Terminology; Operation & effect of cyclic, collective, & antitorque controls.	1	Terminology; Operation & effect of cyclic, collective, & antitorque controls.	1
13.2a/13.2b	Structures — General Concepts	Fundamentals of structural systems.	1	Fundamentals of structural systems.	1
13.2b/13.2a	Structures — General Concepts	Zonal & station identification systems; Electrical bonding; Lightning strike protection provisions.	2	Zonal & station identification systems; Electrical bonding; Lightning strike protection provisions.	2
13.3a	Autoflight (ATA 22)	Fundamentals of automatic flight control: — Working principles & current terminology; — Command signal processing; — Modes of operation: roll, pitch, & yaw channels; — Yaw dampers; — Stability augmentation System in helicopters; — Automatic trim control; — Autopilot navigation aids interface.	3	Fundamentals of automatic flight control: — Working principles & current terminology; — Command signal processing; — Modes of operation: roll, pitch, & yaw channels; — Yaw dampers; — Stability augmentation system in helicopters; — Automatic trim control; — Autopilot navigation aids interface.	3
13.3b	Autoflight (ATA 22)	Autothrottle systems; Automatic landing systems: principles & categories, modes of operation, approach, glideslope, land, go-around, system monitors & failure conditions	3	Autothrottle systems & automatic landing systems: — Principles & categories; — Modes of operation; — Approach; — Glideslope; — Land, go-around; — System monitors & failure conditions.	3
13.4a	Communication/Navigation (ATA 23/34)	Fundamentals of radio wave propagation, antennas, transmission lines, communication, receiver & 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.	3	Fundamentals of communication & navigation systems: — Radio wave propagation, antennas, transmission lines, communication, receiver, & transmitter; Working principles of the following systems: — Very high frequency (VHF) communications; — High-frequency (HF) communications; — Satellite communications (SATCOM); — Controller–pilot data link communications (CPDLC); — Audio systems; — 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 navigation satellite systems (GNSSs), Global Positioning System (GPS), ground-based augmentation system (GBAS), satellite-based augmentation system (SBAS) such as the European geostationary navigation overlay service (EGNOS) & the wide area augmentation system (WAAS); — Data link & two-way data link.	3
13.4b	Communication/Navigation (ATA 23/34)	— Air Traffic Control transponder, secondary surveillance radar; — Traffic Alert & Collision Avoidance System (TCAS); — Weather avoidance radar; — Radio altimeter; — Automatic Dependent Surveillance — Broadcast (ADS-B).	3	Fundamentals of aircraft surveillance systems: — Air traffic control transponder, secondary surveillance radar; — Traffic alert & collision avoidance system (TCAS); — Weather avoidance radar; — Radio altimeter; — Automatic dependent surveillance — broadcast (ADS-B) & its other associated services such as FIS-B, TIS-B & multiink; — Inertial navigation system (INS); — ARINC (Aeronautical Radio Incorporated) communication & reporting.	3
13.4c	Communication/Navigation (ATA 23/34)	— Microwave Landing System (MLS); — Very Low Frequency & hyperbolic navigation (VLF/Omega); — Doppler navigation; — Inertial Navigation System (INS); — ARINC communication & reporting (ACARS).	3	INS moved to Module 13.4b. ARINC moved to Module 13.4a. MLS, VLF, hyperbolic & Doppler systems deleted.	0

13.5	Electrical Power (ATA 24)	<ul style="list-style-type: none"> — Installation & operation of batteries; — DC power generation; — AC power generation; — Emergency power generation; — Voltage regulation; — Power distribution; — Inverters, transformers, rectifiers; — Circuit protection; — External/Ground power. 	3	<ul style="list-style-type: none"> — Installation & operation of batteries; — DC power generation; — AC power generation; — Emergency power generation; — Voltage regulation; — Power distribution; — Inverters, transformers, rectifiers; — Circuit protection; — External/ground power. 	3
13.6	Equipment & Furnishings (ATA 25)	Electronic emergency equipment requirements; Cabin entertainment equipment.	3	Electronic emergency equipment requirements.	3
13.7a	Flight Controls (ATA 27)/Flight controls -Primary & secondary 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.	2	<ul style="list-style-type: none"> — Primary controls: aileron, elevator, rudder, spoiler; — Trim control: trim tabs; — High-lift devices; — System operation: manual; — Gust locks & gust lock systems; — Artificial feel, yaw damper, Mach trim, rudder limiter; — Stall-warning systems. 	2
13.7b	Flight controls Actuation & protection		2	<ul style="list-style-type: none"> — Active load control; — Lift dump, speed brakes; — Hydraulic, pneumatic systems; — Stall-protection systems. 	2
13.7b/13.7c	Flight Controls (ATA 27)/Flight controls	System operation: electrical, fly-by-wire.	3	System operation: electrical, fly-by-wire.	3
13.7d	Flight controls -Rotorcraft flight controls (ATA 67):	Topic not applicable to this Part 66 syllabus.	1	Rotorcraft controls: cyclic control, collective control, swashplate, yaw control.	2
13.8	Instruments (ATA 31)	Classification; Atmosphere; Terminology; Pressure-measuring devices & systems; Pitot-static systems; Altimeters; Vertical-speed indicators; Airspeed indicators; Machmeters; Altitude-reporting/alerting systems; Air data computers; Instrument pneumatic systems; Direct-reading pressure & temperature gauges; Temperature-indicating systems; Fuel-quantity-indicating systems; Gyroscopic principles; Artificial horizons; Slip indicators; Directional gyros; Ground Proximity Warning Systems (GPWSs); Compass systems; Flight Data Recording Systems (FDRSs); Electronic Flight Instrument Systems (EFISs); Instrument warning systems including master warning systems & centralised warning panels; Stall warning systems & angle of attack-indicating systems; Vibration measurement & indication; Glass cockpit.	3	<ul style="list-style-type: none"> — Classification; — Atmosphere; — Terminology; — Pressure-measuring devices & systems; — Pitot-static systems; — Altimeters; — Vertical speed indicators; — Airspeed indicators; — Machmeters; — Altitude-reporting/alerting systems; — Air-data computers; — Instrument pneumatic systems; — Direct-reading pressure & temperature gauges; — Temperature-indicating systems; — Gyroscopic principles; — Artificial horizons; — Slip indicators; — Directional gyros; — Ground proximity warning systems (GPWSs); — Compass systems; — Flight data recording systems (FDRSs); — Electronic flight instrument systems (EFISs) — <i>typical system arrangements & cockpit layout</i>; — Instrument warning systems, including master warning systems & centralised warning panels; — Stall-warning systems & angle-of-attack indicating systems; — Vibration measurement & indication; — Glass cockpit; — <i>Types & uses of general test equipment for avionics.</i> 	3
13.9	Lights (ATA 33)	External: navigation, anticollision, landing, taxiing, ice; Internal: cabin, cockpit, cargo; Emergency.	3	External: navigation, anticollision, landing, taxiing, ice; Internal: cabin, cockpit, cargo; Emergency.	3
13.10	On-Board Maintenance Systems (ATA 45)	Central maintenance computers; Data-loading system; Electronic-library system; Printing system; Structure-monitoring system (damage-tolerance monitoring).	3	Central maintenance computers; Data-loading system; Electronic-library system; Printing system; Structure-monitoring system (damage-tolerance monitoring).	3
13.11.1/13.11b	Air Conditioning & Cabin Pressurisation (ATA 21) -Air supply	Sources of air supply including engine bleed, APU & ground cart;	2	Sources of air supply including engine bleed, APU & ground cart; <i>Distribution systems.</i>	1

13.11.2a/13.11c	Air Conditioning & Cabin Pressurisation (ATA 21) Air Conditioning	Air-conditioning systems;	2	Air-conditioning.	
13.11.2b	Air Conditioning & Cabin Pressurisation (ATA 21) Air Conditioning	Air cycle & vapour cycle machines;	3		3
13.11.2c	Air Conditioning & Cabin Pressurisation (ATA 21) Air Conditioning	Distribution systems;	1		
13.11.2d	Air Conditioning & Cabin Pressurisation (ATA 21) Air Conditioning	Flow, temperature & humidity control system.	3		
13.11.3/13.11a	Air Conditioning & Cabin Pressurisation (ATA 21) Pressurisation	Pressurisation systems; Control & indication including control & safety valves; Cabin pressure controllers.	3	— Pressurisation systems; — Cabin pressure controllers, control & safety valves; — Control & indication.	3
13.11.4/13.11d	Air Conditioning & Cabin Pressurisation (ATA 21) Safety & warning devices	Protection & warning devices.	3	Safety and warning devices.	3
13.12a	Fire Protection (ATA 26)	Fire & smoke detection & warning systems; Fire-extinguishing systems; System tests;	3	Fire & smoke detection system & fire-extinguishing systems; — Fire & smoke detection & warning systems; — Fire-extinguishing systems; — System tests.	3
13.12b	Fire Protection (ATA 26)	Portable fire extinguisher.	1	Portable fire extinguisher.	1
13.13/13.13a	Fuel Systems (ATA 28)/(ATA 28, ATA 47)	System layout; Fuel tanks; Supply systems; Dumping, venting & draining;	1	System layout: System layout; Fuel tanks; Supply systems.	1
13.13b/13.13b	Fuel Systems (ATA 28) Fuel handling	Cross-feed & transfer;	2	Cross-feed & transfer;	2
13.13c	Fuel Systems (ATA 28)/(ATA 28, ATA 47) Indications & warnings	Indications & warnings;	3	Indications & warnings;	3
13.13d/13.13b	Fuel Systems (ATA 28)/(ATA 28, ATA 47) Fuel handling	Refuelling & defuelling.	2	Refuelling & defuelling.	2
13.13d	Fuel Systems (ATA 28, ATA 47) Special systems:	Topic not applicable to this Part 66 syllabus.		Dumping, venting & draining; Inert gas systems. Dumping, venting & draining moved from pre-989 13.13. AEv.	1
13.13e	Fuel Systems (ATA 28)/(ATA 28, ATA 47) Balancing	Longitudinal-balance fuel systems.	3	Longitudinal-balance fuel systems.	3
13.14a	Hydraulic Power (ATA 29)	System layout; Hydraulic fluids; Hydraulic reservoirs & accumulators; Filters; Power distribution.	1	System layout; Hydraulic fluids; Hydraulic reservoirs & accumulators; Filters; Power distribution.	1
13.14b	Hydraulic Power (ATA 29) System Operation (1)	Pressure generation: electrical, mechanical, pneumatic; Emergency pressure generation;	3	Pressure generation: electric & mechanical; Pressure control; Indication & warning systems; Servicing.	3
13.14d/13.14b	Hydraulic Power (ATA 29) System Operation (1)	Pressure control;	3	Pressure control;	3
13.14c	Hydraulic Power (ATA 29) System Operation (2)	Indication & warning systems; Interface with other systems.	3	Pressure generation: pneumatic; Emergency pressure generation; Interface with other systems.	3
13.15a + 13.15c	Ice & Rain Protection (ATA 30) Principles & Anti-icing	Ice formation, classification, & detection; Anti-icing systems: electrical, hot-air, & chemical.	2	Ice formation, classification, & detection; Anti-icing systems: electrical, hot-air, & chemical.	2
13.15b	Ice & Rain Protection (ATA 30) De-icing	De-icing systems: electrical, hot-air, pneumatic, & chemical; Probe & drain-heating.	3	De-icing systems: electrical, hot-air, pneumatic, & chemical; Probe & drain-heating.	3
13.15c/13.15e	Ice & Rain Protection (ATA 30)	Rain-repellent.	1	Rain-repellent.	1
13.15e/13.15d	Ice & Rain Protection (ATA 30)	Wiper systems.	1	Wiper systems.	1
13.16a	Landing Gear (ATA 32) Description	Construction, shock absorbing;	1	Construction, shock absorbing;	1
13.16b	Landing Gear (ATA 32) Systems	Extension & retraction systems: normal & emergency; Indications & warnings; Wheels, brakes, antiskid & automatic braking systems;	3	Extension & retraction systems: normal & emergency; Indications & warnings; Wheels, brakes, antiskid, & autobraking; Steering .	3

13.16c	Landing Gear (ATA 32) Description	Tyres;	1	Tyres;	1
13.16d	Landing Gear (ATA 32)	Steering; Air-ground sensing.	3	Air-ground sensing.	3
13.17	Oxygen (ATA 35)	System layout: cockpit, cabin; Sources, storage, charging, & distribution; Supply regulation; Indications & warnings.	3	System layout: cockpit, cabin; Sources, storage, charging, & distribution; Supply regulation; Indications & warnings.	3
13.18a	Pneumatic/Vacuum (ATA 36)	System layout; Sources: engine/APU, compressors, reservoirs, ground supply;	2	System layout; Sources: engine/APU, compressors, reservoirs, ground supply;	2
13.18b	Pneumatic/Vacuum (ATA 36)	Pressure control; Indications & warnings; — Interfaces with other systems.	3	Pressure control; Indications & warnings; — Interfaces with other systems.	2
13.18c	Pneumatic/Vacuum (ATA 36)	Distribution;	1	Distribution;	2
13.19	Water/Waste (ATA 38)	— Water system layout, supply, distribution, servicing, & draining; — Toilet system layout, flushing & servicing.	2	— Water system layout, supply, distribution, servicing, & draining; — Toilet system layout, flushing & servicing.	2
13.20/13.20a	Integrated Modular Avionics (IMA) (ATA 42)	Overall system description & theory: Core system; Network components. Note: Functions that may be typically integrated into the integrated modular avionics (IMA) modules are, among others: — Bleed management; — Air pressure control; — Air ventilation & control; — Avionics & cockpit ventilation control, temperature control; — Air traffic communication; — Avionics communication router; — Electrical load management; — Circuit breaker monitoring; — Electrical system Built-In Test Equipment (BITE); — Fuel management; — Braking control; — Steering control; — Landing gear extension & retraction; — Tyre pressure indication; — Oleo pressure indication; — Brake temperature monitoring.	3	Overall system description & theory: Core system; Network components. Note: Functions that may be typically integrated into the integrated modular avionics (IMA) modules are, among others: — Bleed management; — Air pressure control; — Air ventilation & control; — Avionics & cockpit ventilation control, temperature control; — Air traffic communication; — Avionics communication router; — Electrical load management; — Circuit breaker monitoring; — Electrical system built-in test equipment (BITE); — Fuel management; — Braking control; — Steering control; — Landing gear extension & retraction; — Tyre pressure indication; — Oleo pressure indication; — Brake temperature monitoring.	3
13.20b	Integrated Modular Avionics (IMA) (ATA 42)	Topic not applicable to this Part 66 syllabus.	0	Typical system layouts.	3
13.21	Cabin Systems (ATA 44)	The units & components which furnish a means of entertaining the passengers & providing communication within the aircraft (Cabin Intercommunication Data System (CIDS)) & between the aircraft cabin & ground stations (Cabin Network Service (CNS)). They include voice, data, music & video transmissions. CIDS provides an interface between cockpit/cabin crew & cabin systems. These systems support data exchange between the different related Line Replaceable Units (LRUs) & they are typically operated via Flight Attendant Panels (FAPs). CNS typically consists of 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.	3	System architecture, operation & control of systems for: — passenger in-flight entertainment; — communication within the aircraft (cabin intercommunication data system (CIDS)); — communication between the aircraft cabin & ground stations, including voice, data, music & video transmission. CIDS interface between cockpit/cabin crew & cabin systems; Data exchange between the different related line replaceable units (LRUs); Flight attendant panels (FAPs). CNS server & interfaces with the following systems: — Data/radio communication system; — 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). The CNS may host functions such as: — access to predeparture/departure reports; — email/intranet/internet access; — passenger database.	3
13.22	Information Systems (ATA 46)	The units & components which furnish a means of storing, updating & retrieving digital information traditionally provided on paper, microfilm or microfiche. They include units that are dedicated to the information storage & retrieval function such as the electronic library mass storage & controller, but they do not include units or components installed for other uses & shared with other systems, such as flight deck printer or general-use display. Typical examples include: — Air Traffic & Information Management systems & Network Server systems. — Aircraft general information system; — Flight deck information system; — Maintenance information system; — Passenger cabin information system; — Miscellaneous information systems.	3	The units & components which furnish a means of storing, updating, & retrieving digital information traditionally provided on paper, microfilm or microfiche. They include units that are dedicated to the information storage & retrieval function, such as the electronic library mass storage & controller, but they do not include units or components installed for other uses & shared with other systems, such as flight deck printer or general-use display. Typical examples include: — air traffic & information management systems & network server systems; — aircraft general information system; — flight deck information system; — maintenance information system; — passenger cabin information system; — miscellaneous information systems; — other linked systems.	3

14.1a	Turbine Engines/Engines	Constructional arrangement & operation of turbojet, turbofan, turboshaft & turbopropeller engines;	1		Constructional arrangement & operation of turbojet, turbofan, turboshaft, & turboprop engines.	1	
14.1b/14.1e	Turbine Engines/Engines	Electronic Engine control & fuel-metering systems (full authority digital engine control (FADEC)).	2		Electronic engine control & fuel-metering systems (full authority digital engine control (FADEC)).	2	
14.1b	Engines	Topic not applicable to this Part 66 syllabus.	0		Constructional arrangement & operation of piston engines.	1	
14.1c	Engines	Topic not applicable to this Part 66 syllabus.	0		Constructional arrangement & operation of electric & hybrid engines, their electric energy storage & control systems.	2	
14.2	Turbine Engines Engine Indicating Systems/Engines Electric/electronic engine indication 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 & temperature; Fuel pressure, temperature & flow; Manifold pressure; Engine torque; Propeller speed.	2		— Exhaust gas temperature / interstage turbine temperature systems; — Cylinder head temperature , engine coolant temperature, engine speed; — Engine thrust indication: engine pressure ratio, engine turbine discharge pressure or jet pipe pressure systems; — Vibration measurement systems; — Oil pressure & temperature; — Fuel pressure, temperature, & flow; — Manifold pressure; — Engine torque.	2	
14.3	Engines Propeller systems	Topic not applicable to this Part 66 syllabus.	0		— Propeller speed indication; — Speed control & pitch change methods — electrical/electronic; — Synchronising & synchrophasing equipment; — Electrical anti-icing/de-icing equipment.	2	
14.3	Turbine Engines/Engines Starting & Ignition systems	— Operation of engine start systems & components; — Ignition systems & components; — Maintenance safety requirements.	2		— Operation of engine start systems & components; — Ignition systems & components; — Maintenance safety requirements.	2	
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 & operation of turbojet, turbofan, turboshaft, turboprop.	1	2	— Potential energy, kinetic energy, Newton's laws of motion, Brayton cycle; — The relationship between force, work, power, energy, velocity, & acceleration; — Constructional arrangement & operation of turbojet, turbofan, turboshaft, turboprop, & geared turbofan engines .	1	2
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 & engine pressure ratio; — Pressure, temperature, & velocity of the gas flow; — Engine ratings, static thrust, influence of speed, altitude & hot climate, flat rating, limitations.	0	2	— Gross thrust, net thrust, choked nozzle thrust, thrust distribution, resultant thrust, thrust horsepower, equivalent shaft horsepower, specific fuel consumption; — Engine efficiencies; — By-pass ratio & engine pressure ratio; — Pressure, temperature, & velocity of the gas flow; — Engine ratings, static thrust, influence of speed, altitude & hot climate, flat rating, limitations.	0	2
15.3	Inlet	— Compressor inlet ducts; — Effects of various inlet configurations; — Ice protection.	2	2	— Compressor inlet ducts; — Effects of various inlet configurations; — Ice protection.	2	2
15.4	Compressors	— Axial & centrifugal types; — Constructional features, & operating principles, & applications; — Fan balancing; — Operation: - Causes & effects of compressor stall & surge; - Methods of air-flow control: bleed valves, variable inlet guide vanes, variable stator vanes, rotating stator blades; - Compressor ratio.	1	2	— Axial & centrifugal types; — Constructional features, & operating principles, & applications; — Fan balancing; — Operation: - Causes & effects of compressor stall & surge; - Methods of air-flow control: bleed valves, variable inlet guide vanes, variable stator vanes, rotating stator blades; - Compressor ratio.	1	2
15.5	Combustion Section	Constructional features & principles of operation.	1	2	Constructional features & principles of operation.	1	2
15.6	Turbine Section	— Operation & characteristics of different turbine blade types; — Blade-to-disk attachment; — Nozzle guide vanes; — Causes & effects of turbine blade stress & creep.	2	2	— Operation & characteristics of different turbine blade types; — Blade-to-disk attachment; — Nozzle guide vanes; — Causes & effects of turbine blade stress & creep.	2	2
15.7	Exhaust	— Constructional features & principles of operation; — Convergent, divergent, & variable area nozzles; — Engine noise reduction; — Thrust reversers.	1	2	— Constructional features & principles of operation; — Convergent, divergent, & variable area nozzles; — Engine noise reduction; — Thrust reversers.	1	2
15.8	Bearings & Seals	Constructional features & principles of operation.	0	2	Constructional features & principles of operation.	0	2
15.9	Lubricants & Fuels	Properties & specifications; Fuel additives; Safety precautions.	1	2	— Properties & specifications of standard, alternate, & drop-in fuel ; — Properties & specifications of lubricants ; — Fuel additives; — Safety precautions.	1	2
15.10	Lubrication Systems	System operation/lay-out & components.	1	2	System operation/lay-out & components.	1	2
15.11	Fuel Systems	Operation of engine control & fuel metering systems including electronic engine control (FADEC); Systems lay-out & components.	1	2	— Operation of engine control & fuel-metering systems, including electronic engine control (full authority digital engine control (FADEC)) & electronic power augmentation ; — System layout & components.	1	2
15.12	Air Systems	Operation of engine air distribution & anti-icing control systems, including internal cooling, & sealing, & external air services.	1	2	Operation of engine air distribution & anti-icing control systems, including internal cooling, & sealing, & external air services.	1	2

15.13	Starting & Ignition Systems	<ul style="list-style-type: none"> — Operation of engine start systems & components; — Ignition systems & components; — Maintenance safety requirements. 	1	2	<ul style="list-style-type: none"> — Operation of engine start systems & components; — Ignition systems & components; — Maintenance safety requirements. 	1	2
15.14	Engine Indication Systems	<ul style="list-style-type: none"> — Exhaust Gas Temperature / Interstage Turbine Temperature; — Engine Thrust Indication: Engine Pressure Ratio, engine turbine discharge pressure or jet pipe pressure systems; — Oil pressure & temperature; — Fuel pressure & flow; — Engine speed; — Vibration measurement & indication; — Torque; — Power. 	1	2	<ul style="list-style-type: none"> — Exhaust gas temperature / interstage turbine temperature; — Engine thrust indication: engine pressure ratio, engine turbine discharge pressure or jet pipe pressure systems; — Oil pressure & temperature; — Fuel pressure & flow; — Engine speed; — Vibration measurement & indication; — Torque; — Power. 	1	2
15.15	Power Augmentation Systems	Operation & applications; Water injection, water methanol; Afterburner systems.	0	1	Topic not applicable to this Part 66 syllabus.		
15.15	Alternate turbine constructions	Topic not applicable to this Part 66 syllabus.			<ul style="list-style-type: none"> — Geared turbofan (GTF); — Variable fan blades; — Open rotor/propfan; — Hybrid turbine-electric concepts & electric power augmentation; — Future trends & developments. 	0	1
15.16	Turbo-prop Engines	<ul style="list-style-type: none"> — Gas-coupled/free-turbine & gear-coupled turbines; — Reduction gears; — Integrated engine & propeller controls; — Overspeed safety devices. 	1	2	<ul style="list-style-type: none"> — Gas-coupled/free-turbine & gear-coupled turbines; — Reduction gears; — Integrated engine & propeller controls; — Overspeed safety devices. 	1	2
15.17	Turbo-shaft Engines	Arrangements, drive systems, reduction gearing, couplings, control systems.	1	2	Arrangements, drive systems, reduction gearing, couplings, control systems.	1	2
15.18	Auxiliary Power Units (APUs)	Purpose, operation, protective systems.	1	2	Purpose, operation, protective systems.	1	2
15.19	Powerplant Installation	Configuration of firewalls, cowlings, acoustic panels, engine mounts, antivibration mounts, hoses, pipes, feeders, connectors, wiring looms, control cables & rods, lifting points & drains.	1	2	Configuration of firewalls, cowlings, acoustic panels, engine mounts, antivibration mounts, hoses, pipes, feeders, connectors, wiring looms, control cables & rods, lifting points & drains.	1	2
15.20	Fire Protection Systems	Operation of fire-detection & fire-extinguishing systems.	1	2	Operation of fire-detection & fire-extinguishing systems.	1	2
15.21	Engine Monitoring & Ground Operation	<ul style="list-style-type: none"> — Procedures for starting & ground run-up; — Interpretation of engine power output & parameters; — Trend (including oil analysis, vibration & borescope) monitoring; — Inspection of engine & components to criteria, tolerances & data specified by the engine manufacturer; — Compressor washing/cleaning; — Foreign Object Damage (FOD). 	1	3	<ul style="list-style-type: none"> — Procedures for starting & ground run-up; — Interpretation of engine power output & parameters; — Trend (including oil analysis, vibration & borescope) monitoring; — Inspection of engine & components to criteria, tolerances & data specified by the engine manufacturer; — Compressor washing/cleaning; — Foreign object damage (FOD). 	1	3
15.22	Engine Storage & Preservation	Preservation & depreservation for the engine & its accessories/systems.	0	2	Preservation & depreservation for the engine & its accessories/systems.	0	2
17.1	Fundamentals	<ul style="list-style-type: none"> — Blade element theory; — High/low blade angle, reverse angle, angle of attack, rotational speed; — Propeller slip; — Aerodynamic, centrifugal, & thrust forces; — Torque; — Relative airflow on blade angle of attack; — Vibration & resonance. 	1	2	<ul style="list-style-type: none"> — Blade element theory; — High/low blade angle, reverse angle, angle of attack, rotational speed; — Propeller slip; — Aerodynamic, centrifugal, & thrust forces; — Torque; — Relative airflow on blade angle of attack; — Vibration & resonance. 	1	2
17.2	Propeller Construction	Construction methods & materials used in wooden, composite & metal propellers; Blade station, blade face, blade shank, blade back & hub assembly; Fixed pitch, controllable pitch, constant speeding propeller; Propeller/spinner installation.	1	2	<ul style="list-style-type: none"> — Construction methods & materials used in wooden, composite & metal propellers; — Blade station, blade face, blade shank, blade back / thrust face & hub assembly; — Fixed pitch, controllable pitch, constant speeding propeller; — Propeller/spinner installation. 	1	2
17.3	Propeller Pitch Control	<ul style="list-style-type: none"> — Speed control & pitch change methods, — mechanical & electrical/electronic; — Feathering & reverse pitch; — Overspeed protection. 	1	2	<ul style="list-style-type: none"> — Speed control & pitch change methods, — mechanical & electrical/electronic; — Feathering & reverse pitch; — Overspeed protection. 	1	2
17.4	Propeller Synchronising	Synchronising & synchrophasing equipment.	0	2	Synchronising & synchrophasing equipment.	0	2
17.5	Propeller Ice Protection	Fluid & electrical de-icing equipment.	1	2	Fluid & electrical de-icing equipment.	1	2
17.6	Propeller Maintenance	<ul style="list-style-type: none"> — Static & dynamic balancing; — Blade tracking; — Assessment of blade damage, erosion, corrosion, impact damage, delamination; — Propeller treatment/repair schemes; — Propeller engine running. 	1	2	<ul style="list-style-type: none"> — Static & dynamic balancing; — Blade tracking; — Assessment of blade damage, erosion, corrosion, impact damage, delamination; — Propeller treatment/repair schemes; — Propeller engine running. 	1	3
17.7	Propeller Storage & Preservation	Propeller preservation & depreservation.	1	2	Propeller preservation & depreservation.	1	2