THAILAND CIVIL AVIATION REGULATION

Acceptable Means of Compliance and Guidance Material to TCAR PEL – Part FCL

Flight Crew Licensing

Subpart A to G

(Preparatory Manual)

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RECORD OF REVISIONS

Revision No.	Date (DD□MMM□YYYY)	Subject	Insert By (Department□Division)
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INTRODUCTION AND APPLICABILITY

In this publication the word 'should' is used to indicate that the Organisation, Owner or Operator has a degree of latitude in adhering to the requirement, particularly where the nature of the operation - or proposed operation - affects their ability to achieve the necessary degree of compliance with the requirement; provided that an acceptable level of safety is achieved.

If the Organisation's/owner's/operator's response is deemed to be inadequate by the Director General, a specific requirement or restriction may be applied as a condition of the appropriate instrument to be issued under Thailand Civil Aviation Regulations. This publication includes associated means of compliance and interpretative material wherever possible and, unless specifically stated otherwise, clarification will be based on this material or other relevant CAAT documentation.

These Acceptable Means of Compliance (AMCs) and Guidance Material (GM) to TCAR PEL Part FCL are broadly based upon or derived from the AMCs and GM corresponding to European Union Aircrew Regulation (EU) 1178/2011 up to and including EASA Executive Director decision "ED Decision 2020/005/R".

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SUBPART A - GENERAL REQUIREMENTS

AMCs and GM to SECTION 1 - General

GM1 FCL.005 - Scope

INTERPRETATIVE MATERIAL

(a) Whenever licences, ratings, approvals or certificates are mentioned in TCAR PEL Part FCL regulation, these are meant to be valid licences, ratings, approvals or certificates issued in accordance with TCAR PEL Part FCL regulation. In all other cases, these documents are specified.

(b) Whenever a reference is made to States to recognition of licences, ratings, approvals or certificates, this means the State of Thailand and states associated to the International Civil Aviation Organisation.

(c) Whenever an inclusive or exclusive 'or', it should be understood within the context of the whole meaning of the requirement in which it is used.

GM1 FCL.010 - Definitions

ABBREVIATIONS

The following abbreviations apply to the Acceptable Means of Compliance and Guidance Material to TCAR PEL Part FCL regulation:

A	Aeroplane
AC	Alternating Current
ACAS	Airborne Collision Avoidance System
ADF	Automatic Direction Finding
ADS	Aeronautical Design Standard
AFCS	Automatic Flight Control System
AFM	Aircraft Flight Manual
AGL	Above Ground Level
AIC	Aeronautical Information Circular
AIP	Aeronautical Information Publication
AIRAC	Aeronautical Information regulation and control
AIS	Aeronautical Information Services
AMC	Acceptable Means of Compliance
AeMC	Aero-medical Centre
AME	Aero-medical Examiner
AOA	Angle Of Attack
AOH	Aircraft Operating Handbook
AOM	Aircraft Operating Manual

APU	Auxiliary Power Unit
As	Airship
ATC	Air Traffic Control
ATIS	Automatic Terminal Information Service
ATO	Approved Training Organisation
ATP	Airline Transport Pilot
ATPL	Airline Transport Pilot Licence
ATS	Air Traffic Service
AUM	All Up Mass
AUPRTA	Airplane Upset Prevention and Recovery Training Aid
B	Balloon
BCAR	British Civil Airworthiness Requirement
BEM	Basic Empty Mass
BITD	Basic Instrument Training Device
BPL	Balloon Pilot Licence
CAS	Calibrated Air Speed
CAT	Clear Air Turbulence
CB-IR	Competency-based training course for instrument rating
CDFA	Constant-Descent Final Approach
CDI	Course Deviation Indicator
CFI	Chief Flight Instructor
CG	Centre of Gravity
CP	Co-pilot
CPL	Commercial Pilot Licence
CRE	Class Rating Examiner
CRI	Class Rating Instructor
CRM	Crew Resource Management
CS	Certification Specification
CTKI	Chief Theoretical Knowledge Instructor
CQB	Central Question Bank
DC	Direct Current
DF	Direction Finding
DME	Distance Measuring Equipment
DPATO	Defined Point After Take-Off

DPBL	Defined Point Before Landing
DR	Dead Reckoning navigation
DTO	Declared Training Organisation
DVE	Degraded Visual Environment
EFIS	Electronic Flight Instrument System
EIR	En route Instrument Rating (Not applicable in Thailand)
EOL	Engine Off Landings
ERPM	Engine Revolutions per Minute
ETA	Estimated Time of Arrival
ETOPS	Extended-range Twin-engine Operation Performance Standard
FAF	Final Approach Fix
FAR	Federal Aviation Regulations
FCL	Flight Crew Licensing
FE	Flight Examiner
F/E	Flight Engineer
FEM	Flight Examiner Manual
FFS	Full Flight Simulator
FI	Flight Instructor
FIE	Flight Instructor Examiner
FIS	Flight Information Service
FMC	Flight Management Computer
FMS	Flight Management System
FNPT	Flight and Navigation Procedures Trainer
FS	Flight Simulator
FSTD	Flight Simulation Training Device
ft	Feet
FTD	Flight Training Device
G	Gravity forces
GLONASS	Global Orbiting Navigation Satellite System
GM	Guidance Material
GNSS	Global Navigation Satellite Systems
GPL	Glider Pilot Licence
GPS	Global Positioning System
H	Helicopter

HF	High Frequency
HOFCS	High Order Flight Control System
HPA	High Performance Aeroplane
hrs	Hours
HUMS	Health and Usage Monitoring System
HT	Head of Training
IAS	Indicated Air Speed
ICAO	International Civil Aviation Organisation
IGE	In Ground Effect
IFR	Instrument Flight Rules
ILS	Instrument Landing System
IMC	Instrument Meteorological Conditions
IOS	Instructor Operating Station
IR	Instrument Rating
IRE	Instrument Rating Examiner
IRI	Instrument Rating Instructor
ISA	International Standard Atmosphere
JAR	Joint Aviation Requirements
kg	Kilogram
LAPL	Light Aircraft Pilot Licence
LDP	Landing Decision Point
LMT	Local Mean Time
LO	Learning Objectives
LOC-I	Loss of Control In-flight
LOFT	Line Orientated Flight Training
m	Meter
MCC	Multi-Crew Cooperation
MCCI	Multi-Crew Cooperation Instructor
ME	Multi-engine
MEL	Minimum Equipment List
MEP	Multi-engine Piston
MET	Multi-engine Turboprop
METAR	Meteorological Aerodrome Report
MI	Mountain Rating Instructor

MP	Multi-pilot
MPA	Multi-pilot Aeroplane
MPL	Multi-crew Pilot Licence
MPH	Multi-pilot Helicopter
MTOM	Maximum Take-off Mass
NDB	Non-directional Beacon
NM	Nautical Miles
NOTAM	Notice To Airmen
NOTAR	No Tail Rotor
OAT	Outside Air Temperature
OBS	Omni Bearing Selector
OEI	One Engine Inoperative
OEM	Original Equipment Manufacturer
OGE	Out of Ground Effect
OML	Operational Multi-pilot Limitation
OSL	Operational Safety Pilot Limitation
OTD	Other Training Devices
PAPI	Precision Approach Path Indicator
PBN	Performance-based Navigation
PF	Pilot Flying
PIC	Pilot-In-Command
PICUS	Pilot-In-Command Under Supervision
PL	Powered-lift
PNF	Pilot Not Flying
POM	Pilot Operating Manual
PPL	Private Pilot Licence
QDM	Magnetic Heading (aircraft to station)
QDR	Magnetic Heading (station to aircraft)
QFE	Atmospheric pressure at aerodrome elevation
QNH	Altimeter sub-scale setting to obtain elevation when on the ground
RNAV	Radio Navigation
RPM	Revolutions per Minute
RRPM	Rotor Revolutions per Minute

R/T	Radiotelephony
S	Sailplane that is called Glider in this regulation
SATCOM	Satellite communication
SE	Single-engine
SEP	Single-engine Piston
SET	Single-engine Turboprop
SFE	Synthetic Flight Examiner
SFI	Synthetic Flight Instructor
SID	Standard Instrument Departure
SIGMET	Significant Meteorological Weather
SLPC	Single Lever Power Control
SOP	Standard Operating Procedure
SP	Single-pilot
SPA	Single-pilot Aeroplane
SPH	Single-pilot Helicopter
SPIC	Student PIC
SSR	Secondary Surveillance Radar
STI	Synthetic Training Instructor
TAF	(Terminal Area Forecasts) Aerodrome Forecast
TAS	True Air Speed
TAWS	Terrain Awareness Warning System
TCH	Type Certificate Holder
TDP	Take-off Decision Point
TEM	Threat and Error Management
TK	Theoretical knowledge
TMG	Touring Motor Glider
TORA	Take-off Run Available
TODA	Take-off Distance Available
TR	Type Rating
TRE	Type Rating Examiner
TRI	Type Rating Instructor
UPRT	Upset Prevention and Recovery Training
UTC	Universal Time Coordinated
V	Velocity

VASI	Visual Approach Slope Indicator
VFR	Visual Flight Rules
VHF	Very High Frequency
VMC	Visual Meteorological Conditions
VOLMET	Meteorological Information for Aircraft in-Flight
VOR	VHF Omni-directional Radio Range
ZFTT	Zero Flight Time Training
ZFM	Zero Fuel Mass

GM2 FCL.010 - Definitions - lateral and vertical navigation

Lateral and vertical navigation guidance refers to the guidance provided either by:

(a) a ground-based radio navigation aid; or

(b) computer-generated navigation data from ground-based, space-based, self-contained navigation aids or a combination of these.

GM3 FCL.010 - Definitions - UPRT

Upset prevention and recovery training (UPRT) definitions

In the context of UPRT, the following abbreviations apply to the Acceptable Means of Compliance and Guidance Material to Part-FCL:

'Advanced UPRT' refers to the advanced UPRT course in accordance with point FCL.745.A.

'Aeroplane upset' refers to an undesired aircraft state characterised by unintentional divergences from parameters normally experienced during operations. An aeroplane upset may involve pitch and/or bank angle divergences as well as inappropriate airspeeds for the conditions.

'Angle of Attack (AoA)' refers to the angle between the oncoming air, or relative wind, and a defined reference line on the aeroplane or wing.

'Approach-to-stall' refers to flight conditions bordered by the stall warning and stall.

'Basic UPRT' refers to the UPRT elements and exercises integrated into training courses for the issue of a CPL, MPL or Phases 1 to 3 of the integrated ATP course.

'Developed upset' refers to a condition meeting the definition of an aeroplane upset.

'Developing upset' refers to any time the aeroplane begins to unintentionally diverge from the intended flight path or airspeed.

'Energy state' refers to how much of each kind of energy (kinetic, potential or chemical) the aeroplane has available at any given time.

'First indication of a stall' refers to the initial aural, tactile or visual sign of a stall event which can be either naturally or synthetically induced.

'Flight crew resilience' refers to the ability of a flight crew member to recognise, absorb and adapt to disruptions.

'Fidelity level' refers to the level of realism assigned to each of the defined FSTD features.

'Flight path' refers to the trajectory or path of the aeroplane travelling through the air over a given space of time.

'Flight path management' refers to active manipulation, using either the aeroplane's automation or manual handling, to command the aeroplane's flight controls in order to direct the aeroplane along a desired trajectory.

'FSTD validation envelope' refers to the envelope consisting of the following three subdivisions:

(a) Flight test validated region

This is the region of the flight envelope which has been validated with flight test data, typically by comparing the performance of the FSTD against the flight test data through tests incorporated in the qualification test guide (QTG) and other flight test data utilised to further extend the model beyond the minimum requirements. Within this region, there is high confidence that the simulator responds similarly to the aircraft. Note that this region is not strictly limited to what has been tested in the QTG; as long as the aerodynamics mathematical model has been conformed to the flight test results, that portion of the mathematical model can be considered to be within the flight test validated region.

(b) Wind tunnel and/or analytical region

This is the region of the flight envelope for which the FSTD has not been compared to flight test data, but for which there has been wind tunnel testing or the use of other reliable predictive methods (typically by the aircraft manufacturer) to define the aerodynamic model. Any extensions to the aerodynamic model that have been evaluated in accordance with the definition of an exemplar stall model (as described in the stall manoeuvre evaluation section) must be clearly indicated. Within this region, there is moderate confidence that the simulator will respond similarly to the aircraft.

(c) Extrapolated region

This is the region extrapolated beyond the flight test validated and wind tunnel/analytical regions. The extrapolation may be a linear extrapolation, a holding of the last value before the extrapolation began, or some other set of values. Whether this extrapolated data is provided by the aircraft or simulator manufacturer, it is a 'best guess' only. Within this region, there is low confidence that the simulator will respond similarly to the aircraft. Brief excursions into this region may still retain a moderate confidence level in FSTD fidelity; however, the instructor should be aware that the FSTD's response may deviate from that of the actual aircraft.

'Load factor' refers to the ratio of a specified load to the weight of the aeroplane, the former being expressed in terms of aerodynamic forces, propulsive forces or ground reactions.

'Loss of Control In-flight (LOC-I)' refers to a categorisation of an accident or incident resulting from a deviation from the intended flight path.

'Manoeuvre-based training' refers to training that focuses on a single event or manoeuvre in isolation.

'Negative training' refers to training which unintentionally introduces incorrect information or invalid concepts, which could actually decrease rather than increase safety.

'Negative transfer of training' refers to the application (and 'transfer') of what was learned in a training environment (i.e. a classroom, an FSTD) to normal practice, i.e. it describes the degree to which what was learned in training is applied to actual, normal practices. In this context, negative transfer of training refers to the inappropriate generalisation of knowledge and skills to a situation or setting in normal practice that does not equal the training situation or setting.

'Original Equipment Manufacturer (OEM)' refers to the original equipment manufacturer of an aircraft or associated parts or equipment or of parts or equipment installed on the basis of a supplemental type certificate (STC).

'Post-stall regime' refers to flight conditions at an AoA greater than the critical AoA.

'Scenario-based training' refers to training that incorporates manoeuvres into real-world experiences to cultivate practical flying skills in an operational environment.

'Stall' refers to loss of lift caused by exceeding the aeroplane's critical AoA.

Note: A stalled condition can exist at any attitude and airspeed, and may be recognised by continuous stall warning activation accompanied by at least one of the following:

(a) buffeting, which could be heavy at times;

(b) lack of pitch authority and/or roll control; and

(c) inability to arrest the descent rate.

Note: It is possible that in certain conditions the stall warning may not be activated.

'Stall event' refers to an occurrence whereby the aeroplane experiences conditions associated with an approach-to-stall or a stall.

'Stall (event) recovery procedure' refers to the manufacturer-approved aeroplane-specific stall recovery procedures, such as those contained in the flight crew operations manual (FCOM). If an OEM-approved recovery procedure does not exist, the aeroplane-specific stall recovery procedure developed by the ATO, based on the stall recovery template, may be used.

'Stall warning' refers to a natural or synthetic indication provided when approaching a stall that may include one or more of the following indications:

(a) aerodynamic buffeting (some aeroplanes will buffet more than others);

(b) reduced roll stability and aileron effectiveness;

(c) visual or aural cues and warnings;

(d) reduced elevator (pitch) authority;

(e) inability to maintain altitude or arrest rate of descent; and

(f) stick shaker activation (if installed).

Note: A stall warning indicates an immediate need to reduce the AoA.

'Startle' refers to the initial, short-term, involuntary physiological and cognitive reactions to an unexpected event that commence the normal human stress response.

'Stick pusher' refers to any device that automatically applies a nose-down movement and pitch force to an aeroplane's control columns to attempt to decrease the aeroplane's AoA. Device activation may occur before or after aerodynamic stall, depending on the aeroplane type.

Note: A stick pusher is not installed on all aeroplane types.

'Stick shaker' refers to a device that automatically vibrates the control column to warn the pilot of an approaching stall.

Note: A stick shaker is not installed on all aeroplane types.

'Stress (response)' refers to the response to a threatening event that includes physiological, psychological and cognitive effects. These effects may range from positive to negative and can either enhance or decrease performance.

'Surprise' refers to the emotionally based recognition of a difference in what was expected and what is actual.

'Train-to-proficiency' refers to approved training designed to achieve end-state performance objectives, providing sufficient assurances that the trained individual is capable of consistently carrying out specific tasks safely and effectively.

Note: In the context of this definition, 'train-to-proficiency' can be replaced by 'training-to-proficiency'.

'Type-specific UPRT' refers to UPRT elements and exercises integrated into training courses for the issue of a class or type rating pursuant to Part-FCL or during recurrent or refresher training for a specific aeroplane class or type.

'Undesired aircraft state' refers to flight-crew-induced aircraft position or speed deviation, misapplication of controls, or incorrect systems configuration, associated with a reduction in margins of safety.

Note (1): Undesired states can be managed effectively, restoring margins of safety, or flight crew response(s) can induce an additional error, incident or accident.

Note (2): All countermeasures are necessary flight crew actions. However, some countermeasures to threats, errors and undesired aircraft states that flight crew employ are built upon 'hard'/systemic-based resources provided by the aviation system.

'Unsafe situation' refers to a situation which has led to an unacceptable reduction in safety margin.

'Unusual attitude' refers to an aircraft in flight intentionally exceeding the parameters normally experienced in line operations or training, as applicable.

'Incipient spin' refers to a transient flight condition in the post-stall regime where an initial, uncommanded roll in excess of 45° has resulted from yaw asymmetry during a stall and which, if recovery action is not taken, will lead rapidly to a developing spin. Prompt recovery during this incipient spin stage will normally result in an overall heading change, from pre-stall conditions, of not more than 180°.

'Developing spin' refers to a flight condition in the post-stall regime where the aeroplane exhibits abnormal, but varying, rates of yaw and roll, together with changing pitch attitude, following an incipient spin but before the establishment of a developed spin. A developing spin follows an unrecovered incipient spin and will usually persist, in the absence of any recovery action, until a developed spin ensues.

'Developed spin' refers to a flight condition in the post-stall regime where the aeroplane has achieved approximately constant pitch attitude, yaw rate and roll rate on a descending flight path. In transition from a stall with significant, persistent yaw, with no recovery action, to attaining a developed spin, the aeroplane is likely to have rolled through at least 540°.

'FSTD training envelope' refers to the high and moderate confidence regions of the FSTD validation envelope.'

GM4 FCL.010 - Definitions – Post stall regime

DEFINITIONS IN GM3 FCL.010 RELATED TO THE POST-STALL REGIME

The definitions for 'incipient spin', developing spin' and 'developed spin' in GM3 FCL.010 relate to the post-stall regime in aeroplanes that might typically be used in the context of the advanced UPRT in accordance with point FCL.745.A. The definitions are not intended for application to commercial air transport operations.'

GM5 FCL.010 - Definitions - Available and accessible FSTDs

(a) To determine the availability of an FSTD, the following additional criteria should be taken into account.

The FSTD should be:

(1) certified by the CAAT; or accepted by the CAAT (Foreign FSTDs certified by a foreign authority according to standards not lower than applicable standards in Thailand as per ORA.GEN.105 and ORA.GEN.110)

(2) representative of the operator's or applicant's aircraft class or type, and serviceable; and

(3) representative of the configuration of the operator's or applicant's aircraft.

(b) To determine the accessibility of an FSTD, the following additional criteria should be taken into account.

The FSTD should be:

(1) accessible to the instructor or examiner of the applicant;

(2) accessible for use within the scope of the candidate's/operator's training and checking activities; and

(3) accessible to allow normal programming and prevent excessive scheduling disruptions within the operator's crew roster patterns.

(c) 'irrespective of any time considerations' means that the FSTD may be used at any time during day or night.

(d) If an FSTD is not available or accessible, mitigating measures to ensure the required level of safety should be agreed with the CAAT before testing or checking the applicant in an aircraft.

AMC1 FCL.015 - Application and issue of licences, ratings and certificates

APPLICATION AND REPORT FORMS

Common application and report forms can be found:

(a) For skill tests, proficiency checks for issue, revalidation or renewal of LAPL, BPL, GPL, PPL, CPL and IR in AMC1 to Appendix 7.

(b) For training, skill tests or proficiency checks for ATPL, MPL and class and type ratings, in AMC1 to Appendix 9.

(c) For assessments of competence for instructors, in AMC 5 FCL.935.

GM1 FCL.025 - Theoretical knowledge examinations for the issue of licences and ratings

TERMINOLOGY

The meaning of the following terms used in FCL.025 should be as follows:

(a) 'Entire set of examinations': an examination in all subjects required by the licence level.

(b) 'Examination': the demonstration of knowledge in one or more examination papers.

(c) 'Examination paper': a set of questions, which covers one subject required by the licence level or rating, to be answered by a candidate for examination.

(d) 'Attempt': a try to pass a specific paper.

(e) 'Sitting': a period of time established by the CAAT within which a candidate can take an examination. This period should not exceed 10 consecutive days. Only one attempt at each examination paper is allowed in one sitting.

AMC1 FCL.025(a)(2) - Theoretical Knowledge examination for the issue of licences and ratings

COMPLETION OF THE AREA 100 KSA ASSESSMENT BEFORE FINAL EXAMINATION

Before being recommended by an ATO to sit the final examination paper at the first attempt, an applicant for a professional licence should have successfully completed the applicable Area 100 KSA summative assessments and mental maths test at the ATO.'

AMC1 FCL.050 - Recording of flight time

GENERAL

(f) The record of the flights flown should contain at least the following information:

(1) personal details: name(s) and address of the pilot;

(2) for each flight:

(i) name(s) of PIC;

(ii) date of flight;

(iii) place and time of departure and arrival;

(iv) type, including make, model and variant, and registration of the aircraft;

(v) indication if the aircraft is SE or ME, if applicable;

(vi) total time of flight;

(vii) accumulated total time of flight.

(3) for each FSTD session, if applicable:

(i) type and qualification number of the training device;

(ii) FSTD instruction;

(iii) date;

(iv) total time of session;

(v) accumulated total time.

(4) details on pilot function, namely PIC, including solo, SPIC and PICUS time, co-pilot, dual, FI or FE;

(5) Operational conditions, namely if the operation takes place at night, or is conducted under instrument flight rules.

(g) Logging of time:

(1) PIC flight time:

(i) the holder of a licence may log as PIC time all of the flight time during which he or she is the PIC;

(ii) the applicant for or the holder of a pilot licence may log as PIC time all solo flight time, flight time as SPIC and flight time under supervision provided that such SPIC time and flight time under supervision are countersigned by the instructor;

(iii) the holder of an instructor certificate may log as PIC all flight time during which he or she acts as an instructor in an aircraft;

(iv) the holder of an examiner's certificate may log as PIC all flight time during which he or she occupies a pilot's seat and acts as an examiner in an aircraft;

(v) a co-pilot acting as PICUS on an aircraft on which more than one pilot is required under the type certification of the aircraft or as required by operational requirements provided that such PICUS time is countersigned by the PIC;

(vi) if the holder of a licence carries out a number of flights upon the same day returning on each occasion to the same place of departure and the interval between successive flights does not exceed 30 minutes, such series of flights may be recorded as a single entry.

(2) co-pilot flight time: the holder of a pilot licence occupying a pilot seat as co-pilot may log all flight time as co-pilot flight time on an aircraft on which more than one pilot is required under the type certification of the aircraft, or the regulations under which the flight is conducted;

(3) cruise relief co-pilot flight time: a cruise relief co-pilot may log all flight time as co-pilot when occupying a pilot's seat;

(4) instruction time: a summary of all time logged by an applicant for a licence or rating as flight instruction, instrument flight instruction, instrument ground time, etc., may be logged if certified by the appropriately rated or authorised instructor from whom it was received;

(5) PICUS flight time: provided that the method of supervision is acceptable to the CAAT, a co-pilot may log as PIC flight time flown as PICUS when all the duties and functions of PIC on that flight were carried out in such a way that the intervention of the PIC in the interest of safety was not required.

(h) Format of the record:

(1) details of flights flown under commercial air transport may be recorded in an electronic format maintained by the operator. In this case an operator should make the records of all flights operated by the pilot, including differences and familiarisation training, available upon request to the flight crew member concerned;

(2) for other types of flights in aeroplanes, helicopters and powered-lift aircraft, the pilot should record the details of the flights flown in the following logbook format which may be kept in electronic format. All data set out in (a) should be included..

(3) For gliders, balloons and airships, a suitable format which may be electronic, should be used. That format should contain the relevant items mentioned in (a) and additional information specific to the type of operation.

PILOT LOGBOOK

Holder's name(s) _____

Holder's licence number _____

HOLDER'S ADDRESS:	
_____ _____ _____	_____ _____ _____ *(space for address change)*
_____ _____ _____ *(space for address change)*	_____ _____ _____ *(space for address change)*
_____ _____ _____ *(space for address change)*	_____ _____ _____ *(space for address change)*

1	2		3		4		5				6		7	8	
DATE (dd/mm/yy)	DEPARTURE		ARRIVAL		AIRCRAFT		SINGLE-PILOT TIME		MULTI-PILOT TIME		TOTAL TIME OF FLIGHT		NAME(S) PIC	LANDINGS	
	PLACE	*TIME*	*PLACE*	*TIME*	*MAKE, MODEL, VARIANT*	*REGISTRATION*	*SE*	*ME*						*DAY*	*NIGHT*
						TOTAL THIS PAGE									
						TOTAL FROM PREVIOUS PAGES									
						TOTAL TIME									

9				10								11				12
OPERATIONAL CONDITION TIME				PILOT FUNCTION TIME								FSTD SESSION				REMARKS AND ENDORSEMENTS
NIGHT		*IFR*		*PIC*		*CO-PILOT*		*DUAL*		*INSTRUCTOR*		*DATE (dd/mm/yy)*	*TYPE*	*TOTAL TIME OF SESSION*		
																I certify that the entries in this log are true.
																PILOT'S SIGNATURE

INSTRUCTIONS FOR USE

(i) FCL.050 requires holders of a pilot licence to record details of all flights flown. This logbook enables pilot licence holders to record flying experience in a manner which will facilitate this process while providing a permanent record of the licence holders flying. Pilots who fly regularly aeroplanes and helicopters or other aircraft categories are recommended to maintain separate logbooks for each aircraft category.

(j) Flight crew logbook entries should be as soon as practicable after any flight undertaken. All entries in the flight crew logbook should comply with the following:

(1) in case of paper records, they should be made in ink or indelible pencil; or

(2) in case of electronic records, they should be made and kept in a way to be readily available at the request of the CAAT, and contain all relevant items that are mentioned in (a), certified by the pilot, and in a format acceptable by the CAAT.

(k) The particulars of every flight in the course of which the holder of a flight crew licence acts as a member of the operating crew of an aircraft are to be recorded in the appropriate columns using one line for each flight, provided that if an aircraft carries out a number of flights upon the same day returning on each occasion to the same place of departure and the interval between successive flights does not exceed 30 minutes, such series of flights may be recorded as a single entry.

(l) Flight time is recorded:

(1) for aeroplanes, touring motor gliders and powered-lift aircraft, from the moment an aircraft first moves to taking off until the moment it finally comes to rest at the end of the flight;

(2) for helicopters, from the moment a helicopter's rotor blades start turning until the moment the helicopter finally comes to rest at the end of the flight, and the rotor blades are stopped;

(3) for airships, from the moment an airship is released from the mast to taking off until the moment the airship finally comes to rest at the end of the flight, and is secured on the mast;

(m) When an aircraft carries two or more pilots as members of the operating crew, one of them shall, before the flight commences, be designated by the operator as the aircraft PIC, according to operational requirements, who may delegate the conduct of the flight to another suitably qualified pilot. All flying carried out as PIC is entered in the logbook as 'PIC'. A pilot flying as 'PICUS' or 'SPIC' enters flying time as 'PIC' but all such entries are to be certified by the PIC or FI in the 'Remarks' column of the logbook.

(n) Notes on recording of flight time:

(1) column 1: enter the date (dd/mm/yy) on which the flight commences;

(2) column 2 or 3: enter the place of departure and destination either in full or the internationally recognised three or four letter designator. All times should be in UTC;

(3) column 5: indicate whether the operation was SP or MP, and for SP operation whether SE or ME;

Example:

1	2		3		4		5				6		7	8	
DATE (dd/mm/yy)	DEPARTURE		ARRIVAL		AIRCRAFT		SINGLE PILOT TIME		MULTI-PILOT TIME		TOTAL TIME OF FLIGHT		NAME(S) PIC	LANDINGS	
	PLACE	*TIME*	*PLACE*	*TIME*	*MAKE, MODEL, VARIANT*	*REGISTRATION*	*SE*	*ME*						*DAY*	*NIGHT*
08/04/12	LFAC	1025	EGBJ	1240	PA34-250	G-SENE		✓			2	15	SELF	1	
09/04/12	EGBJ	1810	EGBJ	1930	C152	G-NONE	✓				1	20	SELF		2
11/04/12	LGW	1645	LAX	0225	B747-400	G-ABCD			9	40	9	40	NAME(S) PIC		1

(4) column 6: total time of flight may be entered in hours and minutes or decimal notation as desired;

(5) column 7: enter the name(s) of PIC or SELF as appropriate;

(6) column 8: indicate the number of landings as pilot flying by day or night;

(7) column 9: enter flight time undertaken at night or under instrument flight rules if applicable;

(8) column 10: pilot function time:

(i) enter flight time as PIC, SPIC and PICUS as PIC;

(ii) all time recorded as SPIC or PICUS is countersigned by the aircraft PIC/FI in the 'remarks' (column 12);

(iii) instructor time should be recorded as appropriate and also entered as PIC.

(9) column 11: FSTD:

(i) for any FSTD enter the type of aircraft and qualification number of the device. For other flight training devices enter either FNPT I or FNPT II as appropriate;

(ii) total time of session includes all exercises carried out in the device, including pre- and after-flight checks;

(iii) enter the type of exercise performed in the 'remarks' (column 12), for example operator proficiency check, revalidation.

(10) column 12: the 'remarks' column may be used to record details of the flight at the holder's discretion. The following entries, however, should always be made:

(i) instrument flight time undertaken as part of the training for a licence or rating;

(ii) details of all skill tests and proficiency checks;

(iii) signature of PIC if the pilot is recording flight time as SPIC or PICUS;

(iv) signature of instructor if flight is part of an SEP or TMG class rating revalidation.

(o) When each page is completed, accumulated flight time or hours should be entered in the appropriate columns and certified by the pilot in 'remarks'.

Example:

9				**10**								**11**				**12**
OPERATIONAL CONDITION TIME				PILOT FUNCTION TIME								FSTD SESSION				REMARKS AND ENDORSEMENTS
NIGHT		*IFR*		*PIC*		*CO-PILOT*		*DUAL*		*INSTRUCTOR*		*DATE (dd/mm/yy)*	*TYPE*	*TOTAL TIME OF SESSION*		
		2	15	2	15											
1	20			1	20					1	20					Night rating training
												10/04/12	B747-400 (Q1234)	4	10	Revalidation proficiency check
8	10	9	40	9	40											PIC(US): signature of NAME(S) PIC

AMC1 FCL.055 - Language proficiency

GENERAL

(a) The method of assessment of the language proficiency level (hereinafter: assessment) should be designed to reflect a range of tasks undertaken by pilots but with specific focus on language rather than operational procedures.

(b) The assessment should determine the applicant's ability to:

(1) communicate effectively using standard R/T phraseology;

(2) deliver and understand messages in plain language in both usual and unusual situations that necessitate departure from standard R/T phraseology.

Note: refer to the 'Manual on the Implementation of ICAO Language Proficiency Requirements' (ICAO Doc 9835), Appendix A Part III and Appendix B for further guidance.

ASSESSMENT

(c) The assessment may be subdivided into three elements, as follows:

(1) listening: assessment of comprehension;

(2) speaking: assessment of pronunciation, fluency, structure and vocabulary;

(3) interaction.

(d) The three elements mentioned above may be combined and they can be covered by using a wide variety of means or technologies.

(e) Where appropriate, some or all of these elements may be achieved through the use of the R/T testing arrangements.

(f) When the elements of the testing are assessed separately, the final assessment should be consolidated in the language proficiency endorsement issued by the CAAT.

(g) The assessment may be conducted during one of the several existing checking or training activities, such as licence issue or rating issue and revalidation, line training, operator line checks or proficiency checks.

(h) The CAAT may use its own resources in developing or conducting the language proficiency assessment, or may delegate this task to language proficiency testing centre.

(i) The CAAT should establish an appeal procedure for applicants.

(j) The holder of a licence should receive a statement containing the level and validity of the language endorsements.

(k) Where the assessment method for the English language established by the CAAT is equivalent to that established for the assessment of use of the English language in accordance with AMC2 FCL.055, the same assessment may be used for both purposes.

BASIC ASSESSMENT REQUIREMENTS

(l) The aim of the assessment is to determine the ability of an applicant for a pilot licence or a licence holder to speak and understand the language used for R/T communications.

(1) The assessment should determine the ability of the applicant to use both:

(i) standard R/T phraseology;

(ii) plain language, in situations when standardised phraseology cannot serve an intended transmission.

(2) The assessment should include:

(i) voice-only and face-to-face situations;

(ii) common, concrete and work-related topics for pilots.

(3) The applicants should demonstrate their linguistic ability in dealing with an unexpected turn of events, and in solving apparent misunderstandings.

(4) The assessment should determine the applicant's speaking and listening abilities. Indirect assessments, of grammatical knowledge, reading and writing, are not appropriate.

(5) The assessment should determine the language skills of the applicant in the following areas:

(i) pronunciation:

(A) the extent to which the pronunciation, stress, rhythm and intonation are influenced by the applicant's first language or national variations;

(B) how much they interfere with ease of understanding.

(ii) structure:

(A) the ability of the applicant to use both basic and complex grammatical structures;

(B) the extent to which the applicant's errors interfere with the meaning.

(iii) vocabulary:

(A) the range and accuracy of the vocabulary used;

(B) the ability of the applicant to paraphrase successfully when lacking vocabulary.

(iv) fluency:

(A) tempo;

(B) hesitancy;

(C) rehearsed versus spontaneous speech;

(D) use of discourse markers and connectors.

(v) comprehension:

(A) on common, concrete and work-related topics;

(B) when confronted with a linguistic or situational complication or an unexpected turn of events.

Note: the accent or variety of accents used in the test material should be sufficiently intelligible for an international community of users.

(vi) interactions:

(A) quality of response (immediate, appropriate, and informative);

(B) the ability to initiate and maintain exchanges:

(a) on common, concrete and work-related topics;

(b) when dealing with an unexpected turn of events.

(C) the ability to deal with apparent misunderstandings by checking, confirming or clarifying.

Note: the assessment of the language skills in the areas mentioned above is conducted using the rating scale in AMC2 FCL.055.

(6) When the assessment is not conducted in a face-to-face situation, it should use appropriate technologies for the assessment of the applicant's abilities in listening and speaking, and for enabling interactions (for example: simulated pilot or controller communication).

ASSESSORS

(m) It is essential that the persons responsible for language proficiency assessment ('assessors') are suitably trained and qualified. They should be either aviation specialists (for example current or former flight crew members or air traffic controllers), or language specialists with additional aviation-related training. An alternative approach would be to form an assessment team consisting of an operational expert and a language expert.

(1) The assessors should be trained on the specific requirements of the assessment.

(2) The assessors should not test applicants to whom they have given language training.

CRITERIA FOR THE ACCEPTABILITY OF LANGUAGE PROFICIENCY TESTING CENTRES

(n) To ensure an impartial assessment process, the language assessment should be independent of the language training.

(1) To be accepted, the language proficiency testing centre should demonstrate:

(i) appropriate management and staffing;

(ii) quality system established and maintained to ensure compliance with, and adequacy of, assessment requirements, standards and procedures.

(2) The quality system established by a language proficiency testing centre should address the following:

(i) management;

(ii) policy and strategy;

(iii) processes;

(iv) the relevant provisions of ICAO or TCAR PEL Part-FCL, standards and assessment procedures;

(v) organisational structure;

(vi) responsibility for the development, establishment and management of the quality system;

(vii) documentation;

(viii) quality assurance programme;

(ix) human resources and training (initial and recurrent);

(x) assessment requirements;

(xi) customer satisfaction.

(3) The assessment documentation and records should be kept for a period of time determined by the CAAT and made available to the CAAT, on request.

(4) The assessment documentation should include at least the following:

(i) assessment objectives;

(ii) assessment layout, time scale, technologies used, assessment samples, voice samples;

(iii) assessment criteria and standards (at least for the levels 4, 5 and 6 of the rating scale mentioned in AMC2 FCL.055);

(iv) documentation demonstrating the assessment validity, relevance and reliability;

(v) assessment procedures and responsibilities:

(A) preparation of individual assessment;

(B) administration: location(s), identity check and invigilation, assessment discipline, confidentiality or security;

(C) reporting and documentation provided to the CAAT or to the applicant, including sample certificate;

(D) retention of documents and records.

Note: refer to the 'Manual on the Implementation of ICAO Language Proficiency Requirements' (ICAO Doc 9835) for further guidance.

AMC2 FCL.055 - Language proficiency

RATING SCALE

The following table describes the different levels of language proficiency:

LEVEL	***PRONUNCIATION*** *Assumes a dialect or accent intelligible to the aeronautical community*	***STRUCTURE*** *Relevant grammatical structures and sentence patterns are determined by language functions appropriate to the task*	***VOCABULARY***	***FLUENCY***	***COMPREHENSION***	***INTERACTIONS***
Expert (Level 6)	Pronunciation, stress, rhythm, and intonation, though possibly influenced by the first language or regional variation, almost never interfere with ease of understanding.	Both basic and complex grammatical structures and sentence patterns are consistently well controlled.	Vocabulary range and accuracy are sufficient to communicate effectively on a wide variety of familiar and unfamiliar topics. Vocabulary is idiomatic, nuanced and sensitive to register.	Able to speak at length with a natural, effortless flow. Varies speech flow for stylistic effect, for example to emphasise a point. Uses appropriate discourse markers and connectors spontaneously.	Comprehension is consistently accurate in nearly all contexts and includes comprehension of linguistic and cultural subtleties.	Interacts with ease in nearly all situations. Is sensitive to verbal and non-verbal cues, and responds to them appropriately.
Extended (Level 5)	Pronunciation, stress, rhythm, and intonation, though influenced by the first language or regional variation, rarely interfere with ease of understanding.	Basic grammatical structures and sentence patterns are consistently well controlled. Complex structures are attempted but with errors which sometimes interfere with meaning.	Vocabulary range and accuracy are sufficient to communicate effectively on common, concrete, and work-related topics. Paraphrases consistently and successfully. Vocabulary is sometimes idiomatic.	Able to speak at length with relative ease on familiar topics, but may not vary speech flow as a stylistic device. Can make use of appropriate discourse markers or connectors.	Comprehension is accurate on common, concrete, and work-related topics and mostly accurate when the speaker is confronted with a linguistic or situational complication or an unexpected turn of events. Is able to comprehend a range of speech varieties (dialect or accent) or registers.	Responses are immediate, appropriate, and informative. Manages the speaker or listener relationship effectively.

LEVEL	***PRONUNCIATION*** *Assumes a dialect or accent intelligible to the aeronautical community*	***STRUCTURE*** *Relevant grammatical structures and sentence patterns are determined by language functions appropriate to the task*	***VOCABULARY***	***FLUENCY***	***COMPREHENSION***	***INTERACTIONS***
Operational (Level 4)	Pronunciation, stress, rhythm, and intonation are influenced by the first language or regional variation but only sometimes interfere with ease of understanding.	Basic grammatical structures and sentence patterns are used creatively and are usually well controlled. Errors may occur, particularly in unusual or unexpected circumstances, but rarely interfere with meaning.	Vocabulary range and accuracy are usually sufficient to communicate effectively on common, concrete, and work-related topics. Can often paraphrase successfully when lacking vocabulary particularly in unusual or unexpected circumstances.	Produces stretches of language at an appropriate tempo. There may be occasional loss of fluency on transition from rehearsed or formulaic speech to spontaneous interaction, but this does not prevent effective communication. Can make limited use of discourse markers and connectors. Fillers are not distracting.	Comprehension is mostly accurate on common, concrete, and work-related topics when the accent or variety used is sufficiently intelligible for an international community of users. When the speaker is confronted with a linguistic or situational complication or an unexpected turn of events, comprehension may be slower or require clarification strategies.	Responses are usually immediate, appropriate, and informative. Initiates and maintains exchanges even when dealing with an unexpected turn of events. Deals adequately with apparent misunderstandings by checking, confirming, or clarifying.
Pre-Operational (Level 3)	Pronunciation, stress, rhythm, and intonation are influenced by the first language or regional variation and frequently interfere with ease of understanding.	Basic grammatical structures and sentence patterns associated with predictable situations are not always well controlled. Errors frequently interfere with meaning.	Vocabulary range and accuracy are often sufficient to communicate effectively on common, concrete, and work-related topics but range is limited and the word choice often inappropriate. Is often unable to paraphrase	Produces stretches of language, but phrasing and pausing are often inappropriate. Hesitations or slowness in language processing may prevent effective communication. Fillers are sometimes distracting.	Comprehension is often accurate on common, concrete, and work-related topics when the accent or variety used is sufficiently intelligible for an international community of users. May fall to understand a linguistic or situational complication or an unexpected turn of events.	Responses are sometimes immediate, appropriate, and informative. Can initiate and maintain exchanges with reasonable ease on familiar topics and in predictable situations. Generally

LEVEL	***PRONUNCIATION*** *Assumes a dialect or accent intelligible to the aeronautical community*	***STRUCTURE*** *Relevant grammatical structures and sentence patterns are determined by language functions appropriate to the task*	***VOCABULARY***	***FLUENCY***	***COMPREHENSION***	***INTERACTIONS***
			successfully when lacking vocabulary.			inadequate when dealing with an unexpected turn of events.
Elementary (Level 2)	Pronunciation, stress, rhythm, and intonation are heavily influenced by the first language or regional variation and usually interfere with ease of understanding.	Shows only limited control of few simple memorised grammatical structures and sentence patterns.	Limited vocabulary range consisting only of isolated words and memorised phrases.	Can produce very short, isolated, memorised utterances with frequent pausing and a distracting use of fillers to search for expressions and articulate less familiar words.	Comprehension is limited to isolated, memorised phrases when they are carefully and slowly articulated.	Response time is slow, and often inappropriate. Interaction is limited to simple routine exchanges.
Pre-Elementary (Level 1)	Performs at a level below the elementary level.	Performs at a level below the elementary level.	Performs at a level below the elementary level.	Performs at a level below the elementary level.	Performs at a level below the elementary level.	Performs at a level below the elementary level.

Note: operational Level (Level 4) is the minimum required proficiency level for R/T communication.

Levels 1 through 3 describe pre-elementary, elementary and pre-operational levels of language proficiency respectively, all of which describe a level below the language proficiency requirement.

Levels 5 and 6 describe extended and expert levels at levels of proficiency more advanced than the minimum required standard.

AMC3 FCL.055 - Language proficiency

SPECIFIC REQUIREMENTS FOR HOLDERS OF AN IR

USE OF ENGLISH LANGUAGE

(a) The requirement of FCL.055(d) includes the ability to use the English language for the following purposes:

(1) flight: R/T relevant to all phases of flight, including emergency situations.

(2) ground: all information relevant to the accomplishment of a flight:

(i) be able to read and demonstrate an understanding of technical manuals written in English, for example an operations manual, a helicopter flight manual, etc.;

(ii) pre-flight planning, weather information collection, NOTAMs, ATC flight plan, etc.;

(iii) use of all aeronautical en-route, departure and approach charts and associated documents written in English.

(3) communication: be able to communicate with other crew members in English during all phases of flight, including flight preparation.

(b) Alternatively, the items in (a) above may be demonstrated:

(1) by having passed a specific examination given by the CAAT after having undertaken a course of training enabling the applicant to meet all the objectives listed in (a) above; or

(2) the item in (a)(1) above is considered to be fulfilled, if the applicant has passed an IR, MPL or ATPL skill test and proficiency check during which the two-way R/T communication is performed in English;

(3) the item in (a)(2) above is considered to be fulfilled if the applicant has graduated from an IR, MPL or ATP course given in English or if he or she has passed the theoretical IR or ATPL examination in English;

(4) the item in (a)(3) above is considered to be fulfilled, if the applicant for or the holder of an IR has graduated from an MCC course given in English and is holding a certificate of satisfactory completion of that course or if the applicant has passed a MP skill test and proficiency check for the issue of a class or type rating during which the two-way R/T communication and the communication with other crew members are performed in English.

(c) Where the examination methods referred to above are equivalent to those established for the language proficiency requirements in accordance with AMC1 FCL.055, the examination may be used to issue a language proficiency endorsement.

AMC1 FCL.060(b)(1) - Recent experience

When a pilot needs to carry out one or more flights with an instructor or an examiner to comply with the requirement of FCL.060(b)(1) before the pilot can carry passengers, the instructor or examiner on board those flights will not be considered as a passenger.

GM1 FCL.060(b)(1) - Recent experience

AEROPLANES, HELICOPTERS, POWERED-LIFT, AIRSHIPS AND GLIDERS

If a pilot or a PIC is operating under the supervision of an instructor to comply with the required three take-offs, approaches and landings, no passengers may be on board.

AMC1 FCL.060(b)(5) - Recent experience

NON-COMPLEX HELICOPTERS

Grouping of non-complex helicopters with similar handling and operational characteristics:

(a) Group 1: Bell 206/206L, Bell 407;

(b) Group 2: Hughes 369, MD 500N, MD 520N, MD 600;

(c) Group 3: SA 341/342, EC 120;

(d) Group 4: SA 313/318, SA 315/316/319, AS 350, EC 130;

(e) Group 5: all types listed in AMC1 FCL.740.H (a)(3) and R 22 and R 44.

SUBPART B - LIGHT AIRCRAFT PILOT LICENCE - LAPL

AMCs and GM to SECTION 1 - Common requirements

AMC1 FCL.115 LAPL (A) - Training course

FLIGHT INSTRUCTION FOR THE LAPL (A)

(a) Entry to training

Before being accepted for training an applicant should be informed that the appropriate medical certificate must be obtained before solo flying is permitted.

(b) Flight instruction

(1) The LAPL (A) flight instruction syllabus should take into account the principles of threat and error management and also cover:

(i) pre-flight operations, including mass and balance determination, aircraft inspection and servicing;

(ii) aerodrome and traffic pattern operations, collision avoidance precautions and procedures;

(iii) control of the aircraft by external visual reference;

(iv) flight at critically low air speeds, recognition of, and recovery from, incipient and full stalls;

(v) flight at critically high air speeds, recognition of, and recovery from, spiral dive;

(vi) normal and crosswind take-offs and landings;

(vii) maximum performance (short field and obstacle clearance) take-offs, short-field landings;

(viii) cross-country flying using visual reference, dead reckoning and radio navigation aids;

(ix) emergency operations, including simulated aeroplane equipment malfunctions;

(x) operations to, from and transiting controlled aerodromes, compliance with air traffic services procedures and communication procedures.

(2) Before allowing applicants to undertake their first solo flight, the FI should ensure that the applicants can use R/T communication and can operate the required systems and equipment.

(c) Syllabus of flight instruction

(1) The numbering of exercises should be used primarily as an exercise reference list and as a broad instructional sequencing guide; therefore the demonstrations and practices need not necessarily be given in the order listed. The actual order and content will depend upon the following interrelated factors:

(i) the applicant's progress and ability;

(ii) the weather conditions affecting the flight;

(iii) the flight time available;

(iv) instructional technique considerations;

(v) the local operating environment;

(vi) applicability of the exercises to the aeroplane or TMG type.

(2) Each of the exercises involves the need for the applicant to be aware of the needs of good airmanship and look-out, which should be emphasised at all times.

(i) Exercise 1a: Familiarisation with the aeroplane or TMG:

(A) characteristics of the aeroplane or TMG;

(B) cockpit layout;

(C) systems;

(D) checklists, drills and controls.

(ii) Exercise 1b: Emergency drills:

(A) action if fire on the ground and in the air;

(B) engine cabin and electrical system fire;

(C) systems failure;

(D) escape drills, location and use of emergency equipment and exits.

(iii) Exercise 2: Preparation for and action after flight:

(A) flight authorisation and aeroplane or TMG acceptance;

(B) serviceability documents;

(C) equipment required, maps, etc.;

(D) external checks;

(E) internal checks;

(F) harness, seat or rudder panel adjustments;

(G) starting and warm-up checks;

(H) power checks;

(I) running down system checks and switching off the engine;

(J) parking, security and picketing (for example tie down);

(K) completion of authorisation sheet and serviceability documents.

(iv) Exercise 3: Air experience: flight exercise.

(v) Exercise 4: Effects of controls:

(A) primary effects when laterally level and when banked;

(B) further effects of aileron and rudder;

(C) effects of:

(a) air speed;

(b) slipstream;

(c) power;

(d) trimming controls;

(e) flaps;

(f) other controls, as applicable.

(D) operation of:

(a) mixture control;

(b) carburettor heat;

(c) cabin heating or ventilation.

(vi) Exercise 5a: Taxiing:

(A) pre-taxi checks;

(B) starting, control of speed and stopping;

(C) engine handling;

(D) control of direction and turning;

(E) turning in confined spaces;

(F) parking area procedure and precautions;

(G) effects of wind and use of flying controls;

(H) effects of ground surface;

(I) freedom of rudder movement;

(J) marshalling signals;

(K) instrument checks;

(L) air traffic control procedures.

(vii) Exercise 5b: Emergencies: brake and steering failure.

(viii) Exercise 6: Straight and level:

(A) at normal cruising power, attaining and maintaining straight and level flight;

(B) flight at critically high air speeds;

(C) demonstration of inherent stability;

(D) control in pitch, including use of trim;

(E) lateral level, direction and balance, trim;

(F) at selected air speeds (use of power);

(G) during speed and configuration changes;

(H) use of instruments for precision.

(ix) Exercise 7: Climbing:

(A) entry, maintaining the normal and max rate climb, levelling off;

(B) levelling off at selected altitudes;

(C) en-route climb (cruise climb);

(D) climbing with flap down;

(E) recovery to normal climb;

(F) maximum angle of climb;

(G) use of instruments for precision.

(x) Exercise 8: Descending:

(A) entry, maintaining and levelling off;

(B) levelling off at selected altitudes;

(C) glide, powered and cruise descent (including effect of power and air speed);

(D) side slipping (on suitable types);

(E) use of instruments for precision flight.

(xi) Exercise 9: Turning:

(A) entry and maintaining medium level turns;

(B) resuming straight flight;

(C) faults in the turn (in correct pitch, bank and balance);

(D) climbing turns;

(E) descending turns;

(F) slipping turns (for suitable types);

(G) turns onto selected headings, use of gyro heading indicator and compass;

(H) use of instruments for precision.

(xii) Exercise 10a: Slow flight:

Note: the objective is to improve the student's ability to recognise inadvertent flight at critically low speeds and provide practice in maintaining the aeroplane or TMG in balance while returning to normal air speed.

(A) safety checks;

(B) introduction to slow flight;

(C) controlled flight down to critically slow air speed;

(D) application of full power with correct attitude and balance to achieve normal climb speed.

(xiii) Exercise 10b: Stalling:

(A) safety checks;

(B) symptoms;

(C) recognition;

(D) clean stall and recovery without power and with power;

(E) recovery when a wing drops;

(F) approach to stall in the approach and in the landing configurations, with and without power and recovery at the incipient stage.

(xiv) Exercise 11: Spin avoidance:

(A) safety checks;

(B) stalling and recovery at the incipient spin stage (stall with excessive wing drop, about 45°);

(C) instructor induced distractions during the stall.

(xv) Exercise 12: Take-off and climb to downwind position:

(A) pre-take-off checks;

(B) into wind take-off;

(C) safeguarding the nose wheel (if applicable);

(D) crosswind take-off;

(E) drills during and after take-off;

(F) short take-off and soft field procedure or techniques including performance calculations;

(G) noise abatement procedures.

(xvi) Exercise 13: Circuit, approach and landing:

(A) circuit procedures, downwind and base leg;

(B) powered approach and landing;

(C) safeguarding the nose wheel (if applicable);

(D) effect of wind on approach and touchdown speeds and use of flaps;

(E) crosswind approach and landing;

(F) glide approach and landing;

(G) short landing and soft field procedures or techniques;

(H) flapless approach and landing;

(I) wheel landing (tail wheel aeroplanes);

(J) missed approach and go-around;

(K) noise abattement procedures.

(xvii) Exercise 12/13: Emergencies:

(A) abandoned take-off;

(B) engine failure after take-off;

(C) mislanding and go-around;

(D) missed approach.

Note: in the interests of safety, it will be necessary for pilots trained on nose wheel aeroplanes or TMGs to undergo dual conversion training before flying tail wheel aeroplanes or TMGs, and vice versa.

(xviii) Exercise 14: First solo:

(A) instructor's briefing including limitations;

(B) use of required equipment;

(C) observation of flight and de-briefing by instructor.

Note: during flights immediately following the solo circuit consolidation the following should be revised:

(A) procedures for leaving and rejoining the circuit;

(D) the local area, restrictions, map reading;

(E) use of radio aids for homing;

(F) turns using magnetic compass, compass errors.

(xix) Exercise 15: Advanced turning:

(A) steep turns (45 °), level and descending;

(B) stalling in the turn and recovery;

(C) recoveries from unusual attitudes, including spiral dives.

(xx) Exercise 16: Forced landing without power:

(A) forced landing procedure;

(B) choice of landing area, provision for change of plan;

(C) gliding distance;

(D) descent plan;

(E) key positions;

(F) engine cooling;

(G) engine failure checks;

(H) use of radio;

(I) base leg;

(J) final approach;

(K) landing;

(L) actions after landing.

(xxi) Exercise 17: Precautionary landing:

(A) full procedure away from aerodrome to break-off height;

(B) occasions necessitating a precautionary landing;

(C) in-flight conditions;

(D) landing area selection:

(a) normal aerodrome;

(b) disused aerodrome;

(c) ordinary field.

(E) circuit and approach;

(F) actions after landing.

(xxii) Exercise 18a: Navigation:

(A) flight planning:

(a) weather forecast and actuals;

(b) map selection and preparation:

(1) choice of route;

(2) airspace structure;

(3) safety altitudes.

(c) calculations:

(1) magnetic heading(s) and time(s) en-route;

(2) fuel consumption;

(3) mass and balance;

(4) mass and performance.

(d) flight information:

(1) NOTAMs, etc.;

(2) radio frequencies;

(3) selection of alternate aerodromes.

(e) aeroplane or TMG documentation;

(f) notification of the flight:

(1) pre-flight administrative procedures;

(2) flight plan form.

(B) departure:

(a) organisation of cockpit workload;

(b) departure procedures:

(1) altimeter settings;

(2) ATC liaison in regulated airspace;

(3) setting heading procedure;

(4) noting of ETAs.

(c) maintenance of altitude and heading;

(d) revisions of ETA and heading;

(e) log keeping;

(f) use of radio;

(g) minimum weather conditions for continuation of flight;

(h) in-flight decisions;

(i) transiting controlled or regulated airspace;

(j) diversion procedures;

(k) uncertainty of position procedure;

(l) lost procedure.

(C) arrival and aerodrome joining procedure:

(a) ATC liaison in regulated airspace;

(b) altimeter setting;

(c) entering the traffic pattern;

(d) circuit procedures;

(e) parking;

(f) security of aeroplane or TMG;

(g) refuelling;

(h) closing of flight plan, if appropriate;

(i) post-flight administrative procedures.

(xxiii) Exercise 18b: Navigation problems at lower levels and in reduced visibility:

(A) actions before descending;

(B) hazards (for example obstacles, and terrain);

(C) difficulties of map reading;

(D) effects of wind and turbulence;

(E) vertical situational awareness (avoidance of controlled flight into terrain);

(F) avoidance of noise sensitive areas;

(G) joining the circuit;

(H) bad weather circuit and landing.

(xxiv) Exercise 18c: Radio navigation (basics):

(A) use of GNSS or VOR/ADF:

(a) selection of waypoints or stations;

(b) to or from indications and orientation;

(c) error messages.

(B) use of VHF/DF:

(a) availability, AIP and frequencies;

(b) R/T procedures and ATC liaison;

(c) obtaining a QDM and homing.

(C) use of en-route or terminal radar:

(a) availability and AIP;

(b) procedures and ATC liaison;

(c) pilot's responsibilities;

(d) secondary surveillance radar:

(1) transponders;

(2) code selection;

(3) interrogation and reply.

(xxv) Exercise 19: Stopping and restarting the engine (in the case of TMGs only):

(A) engine cooling;

(B) switching-off procedure;

(C) restarting of the engine.

AMC 2 FCL.115.H LAPL (H) - Training course

FLIGHT INSTRUCTION FOR THE LAPL (H)

(a) Entry to training

Before being accepted for training an applicant should be informed that the appropriate medical certificate must be obtained before solo flying is permitted.

(b) Flight instruction

(1) The LAPL(H) flight instruction syllabus should take into account the principles of threat and error management and also cover:

(i) pre-flight operations, including mass and balance determination, helicopter inspection and servicing;

(ii) aerodrome and traffic pattern operations, collision avoidance precautions and procedures;

(iii) control of the helicopter by external visual reference;

(iv) take-offs, landings, hovering, look-out turns and normal transitions from and to the hover;

(v) emergency procedures, basic autorotations, simulated engine failure and ground resonance recovery if relevant to type;

(vi) sideways and backwards flight and turns on the spot;

(vii) incipient vortex ring recognition and recovery;

(viii) touchdown autorotations, simulated engine-off landings, practice forced landings. Simulated equipment malfunctions and emergency procedures relating to malfunctions of engines, controls, electrical and hydraulic circuits;

(ix) steep turns;

(x) transitions, quick stops, out of wind manoeuvres, sloping ground landings and take-offs;

(xi) limited power and confined area operations including selection of and operations to and from unprepared sites;

(xii) cross-country flying by using visual reference, dead reckoning and, where available and radio navigation aids;

(xiii) operations to and from aerodromes; compliance with air traffic services procedures and communication procedures.

(2) Before allowing applicants to undertake their first solo flight, the FI should ensure that the applicants can use R/T communication and can operate the required systems and equipment.

(c) Syllabus of flight instruction

(1) The numbering of exercises should be used primarily as an exercise reference list and as a broad instructional sequencing guide; therefore the demonstrations and practices need not necessarily be given in the order listed. The actual order and content will depend upon the following interrelated factors:

(i) the applicant's progress and ability;

(ii) the weather conditions affecting the flight;

(iii) the flight time available;

(iv) instructional technique considerations;

(v) the local operating environment;

(vi) applicability of the exercises to the helicopter type.

(2) Each of the exercises involves the need for the applicant to be aware of the needs of good airmanship and look-out, which should be emphasised at all times.

(i) Exercise 1a: Familiarisation with the helicopter:

(A) characteristics of the helicopter, external features;

(B) cockpit layout;

(C) systems;

(D) checklists, procedures, controls.

(ii) Exercise 1b: Emergency procedures:

(A) action if fire on the ground and in the air;

(B) engine, cabin and electrical system fire;

(C) systems failures;

(D) escape drills, location and use of emergency equipment and exits.

(iii) Exercise 2: Preparation for and action after flight:

(A) flight authorisation and helicopter acceptance;

(B) serviceability documents;

(C) equipment required, maps, etc.;

(D) external checks;

(E) internal checks;

(F) seat, harness and flight controls adjustments;

(G) starting and warm-up checks clutch engagement and starting rotors;

(H) power checks;

(I) running down system checks and switching off the engine;

(J) parking, security and picketing;

(K) completion of authorisation sheet and serviceability documents.

(iv) Exercise 3: Air experience:

(A) to introduce the student to rotary wing flight;

(B) flight exercise.

(v) Exercise 4: Effects of controls:

(A) function of flight controls, primary and secondary effect;

(B) effect of air speed;

(C) effect of power changes (torque);

(D) effect of yaw (sideslip);

(E) effect of disc loading (bank and flare);

(F) effect on controls of selecting hydraulics on/off;

(G) effect of control friction;

(H) instruments;

(I) use of carburettor heat or anti-icing control.

(vi) Exercise 5: Power and attitude changes:

(A) relationship between cyclic control position, disc attitude, fuselage attitude and air speed;

(B) flapback;

(C) power required diagram in relation to air speed;

(D) power and air speed changes in level flight;

(E) use of instruments for precision;

(F) engine and air speed limitations.

(vii) Exercise 6a: Straight and level:

(A) at normal cruising power, attaining and maintaining straight and level flight;

(B) control in pitch, including use of control friction or trim;

(C) maintaining direction and balance, (ball or yawstring use);

(D) setting power for selected air speeds and speed changes;

(E) use of instruments for precision.

(viii) Exercise 6b: Climbing:

(A) optimum climb speed, best angle or rate of climb from power required diagram;

(B) initiation, maintaining the normal and maximum rate of climb, levelling off;

(C) levelling off at selected altitudes or heights;

(D) use of instruments for precision.

(ix) Exercise 6c: Descending:

(A) optimum descent speed and best angle or rate of descent from power required diagram;

(B) initiation, maintaining and levelling off;

(C) levelling off at selected altitudes or heights;

(D) descent (including effect of power and air speed);

(E) use of instruments for precision.

(x) Exercise 6d: Turning:

(A) initiation and maintaining medium level turns;

(B) resuming straight flight;

(C) altitude, bank and coordination;

(D) climbing and descending turns and effect on rate of climb or descent;

(E) turns onto selected headings, use of gyro heading indicator and compass;

(F) use of instruments for precision.

(xi) Exercise 7: Basic autorotation:

(A) safety checks, verbal warning and look-out;

(B) entry, development and characteristics;

(C) control of air speed and RRPM, rotor and engine limitations;

(D) effect of AUM, IAS, disc loading, G-forces and density altitude

(E) re-engagement and go-around procedures (throttle over-ride or ERPM control);

(F) vortex condition during recovery;

(G) gentle and medium turns in autorotation;

(H) demonstration of variable flare simulated engine off landing.

(xii) Exercise 8a: Hovering:

(A) demonstrate hover IGE, importance of wind effect and attitude, ground cushion, stability in the hover, effects of over controlling;

(B) student holding cyclic stick only;

(C) student handling collective lever (and throttle) only;

(D) student handling collective lever, (throttle) and pedals;

(E) student handling all controls;

(F) demonstration of ground effect;

(G) demonstration of wind effect;

(H) demonstrate gentle forward running touchdown;

(I) specific hazards, for example snow, dust and litter.

(xiii) Exercise 8b: Hover taxiing and spot turns:

(A) revise hovering;

(B) precise ground speed and height control;

(C) effect of wind direction on helicopter attitude and control margin;

(D) control and coordination during spot turns;

(E) carefully introduce gentle forward running touchdown.

(xiv) Exercise 8c: Hovering and taxiing emergencies:

(A) revise hovering and gentle forward running touchdown, explain (demonstrate where applicable) effect of hydraulics failure in the hover;

(B) demonstrate simulated engine failure in the hover and hover taxi.

(C) demonstrate dangers of mishandling and over-pitching.

(xv) Exercise 9: Take-off and landing

(A) pre-take-off checks or drills;

(B) look-out;

(C) lifting to hover;

(D) after take-off checks;

(E) danger of horizontal movement near ground;

(F) danger of mishandling and overpitching;

(G) landing (without sideways or backwards movement);

(H) after landing checks or drills;

(I) take-off and landing crosswind and downwind.

(xvi) Exercise 10: Transitions from hover to climb and approach to hover:

(A) look-out;

(B) revise take-off and landing;

(C) ground effect, translational lift and its effects;

(D) flapback and its effects;

(E) effect of wind speed and direction during transitions from or to the hover;

(F) the constant angle approach;

(G) demonstration of variable flare simulated engine off landing.

(xvii) Exercise 11a: Circuit, approach and landing:

(A) revise transitions from hover to climb and approach to hover;

(B) circuit procedures, downwind and base leg;

(C) approach and landing with power;

(D) pre-landing checks;

(E) effect of wind on approach and IGE hover

(F) crosswind approach and landing;

(G) go-around;

(H) noise abatement procedures.

(xviii) Exercise 11b: Steep and limited power approaches and landings:

(A) revise the constant angle approach;

(B) the steep approach (explain danger of high sink rate and low air speed);

(C) limited power approach (explain danger of high speed at touch down);

(D) use of the ground effect;

(E) variable flare simulated engine off landing.

(xix) Exercise 11c: Emergency procedures:

(A) abandoned take-off;

(B) missed approach and go-around;

(C) hydraulic off landing (if applicable);

(D) tail rotor control or tail rotor drive failure (briefing only);

(E) simulated emergencies in the circuit to include:

(F) hydraulics failure;

(G) simulated engine failure on take-off, crosswind, downwind and base leg;

(H) governor failure.

(xx) Exercise 12: First solo:

(A) instructor's briefing, observation of flight and debriefing;

(B) warn of change of attitude from reduced and laterally displaced weight;

(C) warn of low tail, low skid or wheel during hover and landing;

(D) warn of dangers of loss of RRPM and overpitching;

(E) pre-take-off checks;

(F) into wind take-off;

(G) procedures during and after take-off;

(H) normal circuit, approaches and landings;

(I) action if an emergency.

(xxi) Exercise 13: Sideways and backwards hover manoeuvring:

(A) manoeuvring sideways flight heading into wind;

(B) manoeuvring backwards flight heading into wind;

(C) combination of sideways and backwards manoeuvring;

(D) manoeuvring sideways and backwards, heading out of wind;

(E) stability and weather cocking;

(F) recovery from backwards manoeuvring, (pitch nose down);

(G) groundspeed limitations for sideways and backwards manoeuvring.

(xxii) Exercise 14: Spot turns:

(A) revise hovering into wind and downwind;

(B) turn on spot through 360º:

(a) around pilots position;

(b) around tail rotor;

(c) around helicopter geometric centre;

(d) square and safe visibility clearing turn.

(C) rotor RPM control, torque effect, cyclic limiting stops due to CG position and wind speed and direction.

(xxiii) Exercise 15: Hover OGE and vortex ring:

(A) establishing hover OGE;

(B) drift, height or power control;

(C) demonstration of incipient stage of vortex ring, recognition and recovery (from a safe altitude);

(D) loss of tail rotor effectiveness.

(xxiv) Exercise 16: Simulated EOL:

(A) the effect of weight, disc loading, density attitude and RRPM decay;

(B) revise basic autorotation entry;

(C) optimum use of cyclic and collective to control speed or RRPM;

(D) variable flare simulated EOL;

(E) demonstrate constant attitude simulated EOL;

(F) demonstrate simulated EOL from hover or hover taxi;

(G) demonstrate simulated EOL from transition and low level.

(xxv) Exercise 17: Advanced autorotation:

(A) over a selected point at various height and speed;

(B) revise basic autorotation: note ground distance covered;

(C) range autorotation;

(D) low speed autorotation;

(E) constant attitude autorotation (terminate at safe altitude);

(F) 'S' turns;

(G) turns through 180° and 360°;

(H) effects on angles of descent, IAS, RRPM and effect of AUM.

(xxvi) Exercise 18: Practice forced landings:

(A) procedure and choice of the forced landing area;

(B) forced landing checks and crash action;

(C) re-engagement and go-around procedures.

(xxvii) Exercise 19: Steep turns:

(A) steep (level) turns (30° bank);

(B) maximum rate turns (45° bank if possible);

(C) steep autorotative turns;

(D) faults in the turn: balance, attitude, bank and coordination;

(E) RRPM control and disc loading;

(F) vibration and control feedback;

(G) effect of wind at low level.

(xxviii) Exercise 20: Transitions:

(A) revise ground effect, translational lift and flapback;

(B) maintaining constant height, (20–30 ft AGL):

(C) transition from hover to minimum 50 knots IAS and back to hover;

(D) demonstrate effect of wind.

(xxix) Exercise 21: Quick stops:

(A) use of power and controls;

(B) effect of wind;

(C) quick stops into wind;

(D) quick stops from crosswind and downwind terminating into wind;

(E) danger of vortex ring;

(F) danger of high disc loading.

(xxx) Exercise 22a: Navigation:

(A) Flight planning:

(a) weather forecast and actuals;

(b) map selection and preparation and use:

(1) choice of route;

(2) controlled airspace, danger and prohibited areas;

(3) safety altitudes and noise abatement considerations.

(c) calculations:

(1) magnetic heading(s) and time(s) en-route;

(2) fuel consumption;

(3) mass and balance.

(d) flight information:

(1) NOTAMs, etc.;

(2) radio frequencies;

(3) selection of alternate landing sites.

(e) helicopter documentation;

(f) notification of the flight:

(1) pre-flight administrative procedures;

(2) flight plan form (where appropriate).

(B) Departure:

(a) organisation of cockpit workload;

(b) departure procedures:

(1) altimeter settings;

(2) ATC liaison in regulated airspace;

(3) setting heading procedure;

(4) noting of ETAs.

(c) maintenance of height or altitude and heading;

(d) revisions of ETA and heading:

(1) 10° line, double track, track error and closing angle;

(2) 1 in 60 rule;

(3) amending an ETA.

(e) log keeping;

(f) use of radio;

(g) minimum weather conditions for continuation of flight;

(h) in-flight decisions;

(i) transiting controlled or regulated airspace;

(j) uncertainty of position procedure;

(k) lost procedure.

(C) Arrival and aerodrome joining procedure:

(a) ATC liaison in regulated airspace;

(b) altimeter setting;

(c) entering the traffic pattern;

(d) circuit procedures;

(e) parking;

(f) security of helicopter;

(g) refuelling;

(h) closing of flight plan, (if appropriate);

(i) post-flight administrative procedures.

(xxxi) Exercise 22b: Navigation problems at low heights and in reduced visibility:

(A) actions before descending;

(B) hazards (for example obstacles and other aircraft);

(C) difficulties in map reading;

(D) effects of wind and turbulence;

(E) avoidance of noise sensitive areas;

(F) actions in DVE;

(G) decision to divert or make a precautionary landing;

(H) bad-weather circuit and landing;

(I) appropriate procedures and choice of landing area;

(J) precautionary landing.

(xxxii) Exercise 22c: Radio navigation (basics):

(A) Use of GNNS or VOR/NDB:

(a) selection of waypoints;

(b) to or from indications or orientation;

(c) error messages.

(B) Use of VHF/DF:

(a) availability, AIP and frequencies;

(b) R/T procedures and ATC liaison;

(c) obtaining a QDM and homing.

(C) Use of en-route or terminal radar:

(a) availability and AIP;

(b) procedures and ATC liaison;

(c) pilot's responsibilities;

(d) secondary surveillance radar:

(1) transponders;

(2) code selection;

(3) interrogation and reply.

(xxxiii) Exercise 23: Advanced take-off, landings and transitions:

(A) landing and take-off out of wind (performance reduction);

(B) ground effect, translational lift and directional stability variation when out of wind;

(C) downwind transitions;

(D) vertical take-off over obstacles;

(E) reconnaissance of landing site;

(F) running landing;

(G) zero speed landing;

(H) crosswind and downwind landings;

(I) steep approach;

(J) go-around.

(xxxiv) Exercise 24: Sloping ground:

(A) limitations and assessing slope angle;

(B) wind and slope relationship: blade and control stops;

(C) effect of CG when on slope;

(D) ground effect on slope and power required;

(E) right skid up slope;

(F) left skid up slope;

(G) nose up slope;

(H) avoidance of dynamic roll over, dangers soft ground and sideways movement on touchdown;

(I) danger of striking main or tail rotor by harsh control movement near ground.

(xxxv) Exercise 25: Limited power:

(A) take-off power check;

(B) vertical take-off over obstacles;

(C) in-flight power check;

(D) running landing;

(E) zero speed landing;

(F) approach to low hover;

(G) approach to hover;

(H) approach to hover OGE;

(I) steep approach;

(J) go-around.

(xxxvi) Exercise 26: Confined areas:

(A) landing capability and performance assessment;

(B) locating landing site and assessing wind speed and direction;

(C) reconnaissance of landing site;

(D) select markers;

(E) select direction and type of approach;

(F) circuit;

(G) approach to committed point and go-around;

(H) approach;

(I) clearing turn;

(J) landing;

(K) power check and performance assessment in and OGE;

(L) normal take-off to best angle of climb speed;

(M) vertical take-off from hover.

AMC1 FCL.115.(c) – Training course

CHANGE OF TRAINING ORGANISATION

In cases where the applicant completes the training course (theoretical knowledge instruction or flight instruction) at a different DTO or ATO ('completing training organisation') from the one where they have started the training course ('starting training organisation'), the applicant should request from the starting training organisation a copy of the records kept in accordance with point DTO.GEN.220 or point ORA.ATO.120.

AMC1 FCL.115; FCL.120 - LAPL training course and theoretical knowledge examination

SYLLABUS OF THEORETICAL KNOWLEDGE FOR THE LAPL

(a) The training and examination should cover aspects related to non-technical skills in an integrated manner, taking into account the particular risks associated with the licence and the activity. The DTO or the ATO responsible for the training has to check if all the appropriate elements of the training course of theoretical knowledge instruction have been completed to a satisfactory standard before recommending the applicant for the examination.

(b) The following tables contain the syllabi for the courses of theoretical knowledge, as well as for the theoretical knowledge examinations for the LAPL(B) and LAPL(G). The syllabi for the theoretical knowledge instruction and examination for the PPL(A) and PPL(H) in AMC1 FCL.210 and FCL.215 should be used for the LAPL(A) and the LAPL(H), respectively.

I. Common Subjects

[for LAPL(G) and LAPL(B)]

1.	**AIR LAW AND ATC PROCEDURES**
1.1.	International law: conventions, agreements and organisations
1.2.	Airworthiness of aircraft
1.3.	Aircraft nationality and registration marks
1.4.	Personnel licensing
1.5.	Rules of the air
1.6.	Procedures for air navigation: aircraft operations
1.7.	Air traffic regulations: airspace structure
1.8.	ATS and air traffic management
1.9.	AIS
1.10.	Aerodromes, external take-off sites
1.11.	Search and rescue
1.12.	Security
1.13.	Accident reporting
1.14.	National law
2.	**HUMAN PERFORMANCE**
2.1.	Human factors: basic concepts

2.2.	Basic aviation physiology and health maintenance
2.3.	Basic aviation psychology
3.	**METEOROLOGY**
3.1.	The atmosphere
3.2.	Wind
3.3.	Thermodynamics
3.4.	Clouds and fog
3.5.	Precipitation
3.6.	Air masses and fronts
3.7	Pressure systems
3.8.	Climatology
3.9.	Flight hazards
3.10.	Meteorological information
4.	**COMMUNICATIONS**
4.1.	VFR communications
4.2.	Definitions
4.3.	General operating procedures
4.4.	Relevant weather information terms (VFR)
4.5.	Action required to be taken in case of communication failure
4.6.	Distress and urgency procedures
4.7.	General principles of VHF propagation and allocation of frequencies

II. ADDITIONAL Subjects FOR EACH CATEGORY

II.A. GLIDERS

5.	**PRINCIPLES OF FLIGHT - GLIDER**
5.1.	Aerodynamics (airflow)
5.2.	Flight mechanics
5.3.	Stability
5.4.	Control
5.5.	Limitations (load factor and manoeuvres)
5.6.	Stalling and spinning
6.	**OPERATIONAL PROCEDURES - GLIDER**
6.1.	General requirements
6.2.	Launch methods
6.3.	Soaring techniques
6.4.	Circuits and landing
6.5.	Outlanding
6.6.	Special operational procedures and hazards
6.7.	Emergency procedures
7.	**FLIGHT PERFORMANCE AND PLANNING - GLIDER**
7.1.	Verifying mass and balance
7.2.	Speed polar of gliders or cruising speed
7.3.	Flight planning and task setting
7.4.	ICAO flight plan (ATS flight plan)

7.5.	Flight monitoring and in-flight re-planning
8.	**AIRCRAFT GENERAL KNOWLEDGE, AIRFRAME, SYSTEMS AND EMERGENCY EQUIPMENT – GLIDER**
8.1.	Airframe
8.2.	System design, loads and stresses
8.3.	Landing gear, wheels, tyres and brakes
8.4.	Mass and balance
8.5.	Flight controls
8.6.	Instruments
8.7.	Manuals and documents
8.8.	Airworthiness and maintenance
9.	**NAVIGATION – GLIDER**
9.1.	Basics of navigation
9.2.	Magnetism and compasses
9.3.	Charts
9.4.	Dead reckoning navigation
9.5.	In-flight navigation
9.6.	Global navigation satellite systems

II.B. BALLOONS

5.	**PRINCIPLES OF FLIGHT – BALLOON**
5.1.	Principles of flight
5.2.	Aerostatics
5.3.	Loading limitations
5.4.	Operational limitations
6.	**OPERATIONAL PROCEDURES – BALLOON**
6.1.	General requirements
6.2.	Special operational procedures and hazards (general aspects)
6.3.	Emergency procedures
7.	**FLIGHT PERFORMANCE AND PLANNING – BALLOON**
7.1.	Mass
7.1.1.	Purpose of mass considerations
7.1.2.	Loading
7.2.	Performance
7.2.1.	Performance: general
7.3.	Flight planning and flight monitoring
7.3.1.	Flight planning: general
7.3.2.	Fuel planning
7.3.3.	Pre-flight preparation
7.3.4.	ICAO flight plan (ATS flight plan)
7.3.5.	Flight monitoring and in-flight re-planning
8.	**AIRCRAFT GENERAL KNOWLEDGE, ENVELOPE AND SYSTEMS AND EMERGENCY EQUIPMENT – BALLOON**
8.1.	System design, loads, stresses and maintenance
8.2.	Envelope
8.3.	Burner (hot-air balloon and hot-air airship)

8.4.	Fuel cylinders (hot-air balloon or hot-air airship)
8.5.	Basket or gondola
8.6.	Lifting gas (gas balloon)
8.7.	Burning gas (hot-air balloon or hot-air airship)
8.8.	Ballast (gas balloon)
8.9.	Engine (hot-air airship only)
8.10.	Instruments
8.11.	Emergency equipment
9.	**NAVIGATION – BALLOON**
9.1.	General navigation
9.2.	Basics of navigation
9.3.	Magnetism and compasses
9.4.	Charts
9.5.	Dead reckoning navigation
9.6.	In-flight navigation
9.7.	GNSS

AMC1 FCL.120; FCL.125

THEORETICAL KNOWLEDGE EXAMINATION AND SKILL TEST FOR THE LAPL

(a) Theoretical knowledge examination

(1) The examinations should be in written form and should comprise a total of 120 multiple-choice questions covering all the subjects.

(2) For the subject 'communication' practical classroom testing may be conducted.

(3) The CAAT should inform applicants of the language(s) in which the examinations will be conducted.

(b) Skill test

Further training may be required following any failed skill test or part thereof. There should be no limit to the number of skill tests that may be attempted.

(c) Conduct of the test

(1) If the applicant chooses to terminate a skill test for reasons considered inadequate by the FE, the applicant should retake the entire skill test. If the test is terminated for reasons considered adequate by the FE, only those sections not completed should be tested in a further flight.

(2) Any manoeuvre or procedure of the test may be repeated once by the applicant. The FE may stop the test at any stage if it is considered that the applicant's demonstration of flying skill requires a complete retest.

(3) An applicant should be required to fly the aircraft from a position where the PIC functions can be performed and to carry out the test as if there is no other crew member.

AMC1 FCL.125 LAPL - Skill test

CONTENTS OF THE SKILL TEST FOR THE ISSUE OF A LAPL (A)

(a) The route to be flown for the skill test should be chosen by the FE. The route should end at the aerodrome of departure or at another aerodrome. The applicant should be responsible for the flight planning and should ensure that all equipment and documentation for the execution of the flight are on board. The navigation section of the test should have a duration of at least 30 minutes which allows the pilot to demonstrate his/her ability to complete a route with at least two identified waypoints and may, as agreed between applicant and FE, be flown as a separate test.

(b) An applicant should indicate to the FE the checks and duties carried out, including the identification of radio facilities. Checks should be completed in accordance with the flight manual or the authorised checklist for the aeroplane or TMG on which the test is being taken. During pre-flight preparation for the test the applicant should be required to determine power settings and speeds. Performance data for take-off, approach and landing should be calculated by the applicant in compliance with the operations manual or flight manual for the aeroplane or TMG used.

FLIGHT TEST TOLERANCE

(c) The applicant should demonstrate the ability to:

(1) operate the aeroplane or TMG within its limitations;

(2) complete all manoeuvres with smoothness and accuracy;

(3) exercise good judgment and airmanship;

(4) apply aeronautical knowledge;

(5) maintain control of the aeroplane or TMG at all times in such a manner that the successful outcome of a procedure or manoeuvre is never seriously in doubt.

(d) The following limits are for general guidance. The FE should make allowance for turbulent conditions and the handling qualities and performance of the aeroplane or TMG used:

(1) height:

normal flight	± 150 ft

(2) speed:

(i)	take-off and approach	+15/-5 knots
(ii)	all other flight regimes	± 15 knots

CONTENT OF THE SKILL TEST

(e) The skill test contents and sections set out in this AMC should be used for the skill test for the issue of a LAPL (A):

SECTION 1 PRE-FLIGHT OPERATIONS AND DEPARTURE	
Use of checklist, airmanship, control of aeroplane or TMG by external visual reference, anti/de-icing procedures, etc. apply in all sections.	
a	Pre-flight documentation, NOTAM and weather briefing
b	Mass and balance and performance calculation
c	Aeroplane or TMG inspection and servicing
d	Engine starting and after starting procedures
e	Taxiing and aerodrome procedures, pre-take-off procedures
f	Take-off and after take-off checks
g	Aerodrome departure procedures
h	ATC liaison: compliance
SECTION 2 GENERAL AIRWORK	
a	ATC liaison
b	Straight and level flight, with speed changes
c	Climbing: i. best rate of climb; ii. climbing turns; iii. levelling off.
d	Medium (30° bank) turns, look-out procedures and collision avoidance
e	Steep (45 ° bank) turns

f	Flight at critically low air speed with and without flaps
g	Stalling: i. clean stall and recover with power; ii. approach to stall descending turn with bank angle 20 °, approach configuration; iii. approach to stall in landing configuration.
h	Descending: i. with and without power; ii. descending turns (steep gliding turns); iii. levelling off.
SECTION 3 EN-ROUTE PROCEDURES	
a	Flight plan, dead reckoning and map reading
b	Maintenance of altitude, heading and speed
c	Orientation, airspace structure, timing and revision of ETAs, log keeping
d	Diversion to alternate aerodrome (planning and implementation)
e	Flight management (checks, fuel systems, carburettor icing, etc.)
f	ATC liaison: compliance
SECTION 4 APPROACH AND LANDING PROCEDURES	
a	Aerodrome arrival procedures
b	Collision avoidance (look-out procedures)
c	Precision landing (short field landing) and crosswind, if suitable conditions available
d	Flapless landing (if applicable)
e	Approach to landing with idle power
f	Touch and go
g	Go-around from low height
h	ATC liaison
i	Actions after flight
SECTION 5 ABNORMAL AND EMERGENCY PROCEDURES	
This section may be combined with Sections 1 through 4	
a	Simulated engine failure after take-off
b	* Simulated forced landing
c	* Simulated precautionary landing
d	Simulated emergencies

e	Oral questions

* These items may be combined, at the discretion of the FE.

AMC2 FCL.125 LAPL - Skill test

CONTENTS OF THE SKILL TEST FOR THE ISSUE OF A LAPL(H)

(a) The area and route to be flown for the skill test should be chosen by the FE. The route should end at the aerodrome of departure or at another aerodrome. The applicant should be responsible for the flight planning and should ensure that all equipment and documentation for the execution of the flight are on board. The navigation section of the test should consist of at least two legs, each leg of a minimum duration of 10 minutes. The skill test may be conducted in two flights.

(b) An applicant should indicate to the FE the checks and duties carried out, including the identification of radio facilities. Checks should be completed in accordance with the flight manual or the authorised checklist or pilot operating handbook for the helicopter on which the test is being taken. During pre-flight preparation for the test the applicant should be required to determine power settings and speeds. Performance data for take-off, approach and landing should be calculated by the applicant in compliance with the operations manual or flight manual for the helicopter used.

FLIGHT TEST TOLERANCE

(c) The applicant should demonstrate the ability to:

(1) operate the helicopter within its limitations;

(2) complete all manoeuvres with smoothness and accuracy;

(3) exercise good judgment and airmanship;

(4) apply aeronautical knowledge;

(5) maintain control of the helicopter at all times in such a manner that the successful outcome of a procedure or manoeuvre is never seriously in doubt.

(d) The following limits are for general guidance. The FE should make allowance for turbulent conditions and the handling qualities and performance of the helicopter used:

(1) height:

(i)	normal forward flight	± 150 ft
(ii)	with simulated major emergency	± 200 ft
(iii)	hovering IGE flight	± 2 ft

(2) speed:

(i)	take-off approach	+15 knots /-10 knots
(ii)	all other flight regimes	± 15 knots

(3) round drift:

(i)	take-off hover IGE	± 3 ft
(ii)	landing	no sideways or backwards movement

CONTENT OF THE SKILL TEST

(e) The skill test contents and sections set out in this AMC should be used for the skill test for the issue of a LAPL (H):

SECTION 1 PRE-FLIGHT OR POST-FLIGHT CHECKS AND PROCEDURES	
Use of checklist, airmanship, control of helicopter by external visual reference, anti/de-icing procedures, etc. apply in all sections.	
a	Helicopter knowledge (for example technical log, fuel, mass and balance, performance), flight planning, NOTAM, and weather briefing
b	Pre-flight inspection or action, location of parts and purpose
c	Cockpit inspection, starting procedure
d	Communication and navigation equipment checks, selecting and setting frequencies
e	Pre-take-off procedure and ATC liaison
f	Parking, shutdown and post-flight procedure
SECTION 2 HOVER MANOEUVRES, ADVANCED HANDLING AND CONFINED AREAS	
a	Take-off and landing (lift off and touch down)
b	Taxi and hover taxi
c	Stationary hover with head, cross and tail wind
d	Stationary hover turns, 360 ° left and right (spot turns)
e	Forward, sideways and backwards hover manoeuvring
f	Simulated engine failure from the hover
g	Quick stops into and downwind
h	Sloping ground or unprepared sites landings and take-offs
i	Take-offs (various profiles)
j	Crosswind and downwind take-off (if practicable)
k	Take-off at maximum take-off mass (actual or simulated)
l	Approaches (various profiles)
m	Limited power take-off and landing
n	Autorotations (FE to select two items from the following: basic, range, low speed, and 360 ° turns)
o	Autorotative landing
p	Practice forced landing with power recovery

q	Power checks, reconnaissance technique, approach and departure technique
SECTION 3 NAVIGATION AND EN-ROUTE PROCEDURES	
a	Navigation and orientation at various altitudes or heights and map reading
b	Altitude or height, speed, heading control, observation of airspace and altimeter setting
c	Monitoring of flight progress, flight-log, fuel usage, endurance, ETA, assessment of track error, re-establishment of correct track and instrument monitoring
d	Observation of weather conditions and diversion planning
e	Collision avoidance (look-out procedures)
f	ATC liaison with due observance of regulations
SECTION 4 FLIGHT PROCEDURES AND MANOEUVRES	
a	Level flight, control of heading, altitude or height and speed
b	Climbing and descending turns to specified headings
c	Level turns with up to 30 ° bank, 180 ° to 360 ° left and right
SECTION 5 ABNORMAL AND EMERGENCY PROCEDURES (SIMULATED WHERE APPROPRIATE)	
Note: The FE selects 4 items from the following:	
a	Engine malfunctions, including governor failure, carburettor or engine icing and oil system, as appropriate
b	Fuel system malfunction
c	Electrical system malfunction
d	Hydraulic system malfunction, including approach and landing without hydraulics, as applicable
e	Main rotor or anti-torque system malfunction (FFS or discussion only)
f	Fire drills, including smoke control and removal, as applicable
g	Other abnormal and emergency procedures as outlined in appropriate flight manual

AMC1 FCL.125; FCL.235

CONTENTS OF THE SKILL TEST FOR THE ISSUE OF A LAPL(G) AND OF AN GPL

(a) An applicant should be responsible for the flight planning and should ensure that all equipment and documentation for the execution of the flight are on board.

(b) The applicant should indicate to the FE the checks and duties carried out. Checks should be completed in accordance with the flight manual or the authorised checklist for the glider on which the test is being taken.

FLIGHT TEST TOLERANCE

(c) The applicant should demonstrate the ability to:

(1) operate the glider within its limitations;

(2) complete all manoeuvres with smoothness and accuracy;

(3) exercise good judgment and airmanship;

(4) apply aeronautical knowledge;

(5) maintain control of the glider at all times in such a manner that the successful outcome of a procedure or manoeuvre is never seriously in doubt.

CONTENT OF THE SKILL TEST

(d) The skill test contents and sections set out in this AMC should be used for the skill test for the issue of a LAPL(G) and of an GPL:

SECTION 1 PRE-FLIGHT OPERATIONS AND DEPARTURE	
Use of checklist, airmanship (control of glider by external visual reference), look-out. Apply in all sections.	
a	Pre-flight glider (daily) inspection, documentation, NOTAM and weather briefing
b	Verifying in-limits mass and balance and performance calculation
c	Glider servicing compliance
d	Pre-take-off checks
SECTION 2 LAUNCH METHOD Note: at least for one of the three launch methods all the mentioned items are fully exercised during the skill test	
SECTION 2 (A) WINCH OR CAR LAUNCH	
a	Signals before and during launch, including messages to winch driver
b	Adequate profile of winch launch
c	Simulated launch failure
d	Situational awareness
SECTION 2 (B) AEROTOW LAUNCH	
a	Signals before and during launch, including signals to or communications with tow plane pilot for any problems

b	Initial roll and take-off climb
c	Launch abandonment (simulation only or 'talk-through')
d	Correct positioning during straight flight and turns
e	Out of position and recovery
f	Correct release from tow
g	Look-out and airmanship through whole launch phase
SECTION 2 (C) SELF-LAUNCH (powered gliders only)	
a	ATC compliance (if applicable)
b	Aerodrome departure procedures
c	Initial roll and take-off climb
d	Look-out and airmanship during the whole take-off
e	Simulated engine failure after take-off
f	Engine shut down and stowage
SECTION 3 GENERAL AIRWORK	
a	Maintain straight flight: attitude and speed control
b	Coordinated medium (30 ° bank) turns, look-out procedures and collision avoidance
c	Turning on to selected headings visually and with use of compass
d	Flight at high angle of attack (critically low air speed)
e	Clean stall and recovery
f	Spin avoidance and recovery
g	Steep (45 ° bank) turns, look-out procedures and collision avoidance
h	Local area navigation and awareness
SECTION 4 CIRCUIT, APPROACH AND LANDING	
a	Aerodrome circuit joining procedure
b	Collision avoidance: look-out procedures
c	Pre-landing checks
d	Circuit, approach control and landing
e	Precision landing (simulation of out-landing and short field)
f	Crosswind landing if suitable conditions available

AMC2 FCL.125; FCL.235

CONTENTS OF THE SKILL TEST FOR THE ISSUE OF A LAPL (B) AND A BPL

(a) The take-off site should be chosen by the applicant depending on the actual meteorological conditions, the area which has to be over flown and the possible options for suitable landing sites. The applicant should be responsible for the flight planning and should ensure that all equipment and documentation for the execution of the flight are on board.

(b) An applicant should indicate to the FE the checks and duties carried out. Checks should be completed in accordance with the flight manual or the authorised checklist for the balloon on which the test is being taken. During pre-flight preparation for the test the applicant should be required to perform crew and passenger briefings and demonstrate crowd control. The load calculation should be performed by the applicant in compliance with the operations manual or flight manual for the balloon used.

Flight Test Tolerance

(c) The applicant should demonstrate the ability to:

(1) operate the balloon within its limitations;

(2) complete all manoeuvres with smoothness and accuracy

(3) exercise good judgment and airmanship;

(4) apply aeronautical knowledge;

(5) maintain control of the balloon at all times in such a manner that the successful outcome of a procedure or manoeuvre is never seriously in doubt.

CONTENT OF THE SKILL TEST

(d) The skill test contents and sections set out in this paragraph should be used for the skill test for the issue of a LAPL(B) (hot-air balloon) and a BPL (hot-air balloon):

SECTION 1 PRE-FLIGHT OPERATIONS, INFLATION AND TAKE-OFF	
Use of checklist, airmanship, control of balloon by external visual reference, look-out procedures, etc. apply in all sections.	
a	Pre-flight documentation, flight planning, NOTAM and weather briefing
b	Balloon inspection and servicing
c	Load calculation
d	Crowd control, crew and passenger briefings
e	Assembly and layout
f	Inflation and pre-take-off procedures
g	Take-off
h	ATC compliance(if applicable)
SECTION 2 GENERAL AIRWORK	
a	Climb to level flight

b	Level flight
c	Descent to level flight
d	Operating at low level
e	ATC compliance (if applicable)

SECTION 3 EN-ROUTE PROCEDURES	
a	Dead reckoning and map reading
b	Marking positions and time
c	Orientation and airspace structure
d	Maintenance of altitude
e	Fuel management
f	Communication with retrieve crew
g	ATC compliance
SECTION 4 APPROACH AND LANDING PROCEDURES	
a	Approach from low level, missed approach and fly on
b	Approach from high level, missed approach and fly on
c	Pre-landing checks
d	Passenger pre-landing briefing
e	Selection of landing field
f	Landing, dragging and deflation
g	ATC compliance (if applicable)
h	Actions after flight
SECTION 5 ABNORMAL AND EMERGENCY PROCEDURES	
a	Simulated fire on the ground and in the air
b	Simulated pilot light and burner failures
c	Other abnormal and emergency procedures as outlined in the appropriate flight manual.
d	Oral questions

(e) The skill test contents and sections set out in this paragraph should be used for the skill test for the issue of a LAPL(B) (gas balloon) and a BPL (gas balloon):

SECTION 1 PRE-FLIGHT OPERATIONS, INFLATION AND TAKE-OFF	
Use of checklist, airmanship, control of balloon by external visual reference, look-out procedures, etc. apply in all sections.	
a	Pre-flight documentation, flight planning, NOTAM and weather briefing
b	Balloon inspection and servicing
c	Load calculation
d	Crowd control, crew and passenger briefings
e	Assembly and layout

f	Inflation and pre-take-off procedures
g	Take-off
h	ATC compliance (if applicable)
SECTION 2 GENERAL AIRWORK	
a	Climb to level flight
b	Level flight
c	Descent to level flight
d	Operating at low level
e	ATC compliance (if applicable)
SECTION 3 EN-ROUTE PROCEDURES	
a	Dead reckoning and map reading
b	Marking positions and time
c	Orientation and airspace structure
d	Maintenance of altitude
e	Ballast management
f	Communication with retrieve crew
g	ATC compliance
SECTION 4 APPROACH AND LANDING PROCEDURES	
a	Approach from low level, missed approach and fly on
b	Approach from high level, missed approach and fly on
c	Pre-landing checks
d	Passenger pre-landing briefing
e	Selection of landing field
f	Landing, dragging and deflation
g	ATC compliance (if applicable)
h	Actions after flight
SECTION 5 ABNORMAL AND EMERGENCY PROCEDURES	
a	Simulated closed appendix during take-off and climb
b	Simulated parachute or valve failure
c	Other abnormal and emergency procedures as outlined in the appropriate flight manual

d	Oral questions

AMCs and GM to SECTION 2 - Specific requirements for the LAPL for aeroplanes – LAPL(A)

AMC1 FCL.105.A(b)(2) - Privileges and conditions

In the case of previous MPL(A) holders, only those who extended their MPL(A) to include CPL privileges or PPL privileges in accordance with point FCL.405.A(b) may benefit from the exemption of point FCL.105.A(b)(2).

AMC1 FCL.115.A LAPL (A) - Training course

CREDITING: PRE-ENTRY FLIGHT TEST

The pre-entry flight test referred to in FCL.110.A(c) should cover the total content of the syllabus of flight instruction for the issuance of the LAPL(A), in accordance with AMC1 FCL.115.

GM1 FCL.135.A; FCL.135.H

DIFFERENCES AND FAMILIARISATION TRAINING

(a) Differences training requires the acquisition of additional knowledge and training on an appropriate training device or the aircraft.

(b) Familiarisation training requires the acquisition of additional knowledge.

AMC1 FCL.140.A; FCL.140.H; FCL.140.S; FCL.140.B - Recency and revalidation requirements

Training flight items should be based on the exercise items of the proficiency check, as deemed relevant by the instructor, and depending on the experience of the candidate. For aeroplanes and helicopters, the briefing should include a discussion on TEM with special emphasis on decision-making when encountering adverse meteorological conditions or unintentional IMC, as well as on navigation flight capabilities. For gliders and balloons, the discussion should place special emphasis on principal occurrence categories of the activity that is covered by the licence.

AMC1 FCL.140.A (b)(1) LAPL (A) - Recency requirements

The proficiency check should follow the content of the skill test that is set out in AMC1 FCL.125, point (e)

AMCs and GM to SECTION 3 - Specific requirements for the LAPL for helicopters - LAPL(H)

AMC1 FCL.110.H LAPL (H) - Experience requirements and crediting

CREDITING: PRE-ENTRY FLIGHT TEST

The pre-entry flight test referred to in FCL.110.H (b) should cover the total content of the syllabus of flight instruction for the issuance of the LAPL(H), in accordance with AMC2 FCL.115.

GM1 FCL.135.A; FCL.135.H

DIFFERENCES AND FAMILIARISATION TRAINING

(a) Differences training requires the acquisition of additional knowledge and training on an appropriate training device or the aircraft.

(b) Familiarisation training requires the acquisition of additional knowledge.

AMC1 FCL.140.H (b)(1) LAPL (H) - Recency requirements

The proficiency check should follow the content of the skill test that is set out in AMC 2 FCL.115, point (e).

AMC1 FCL.140.A; FCL.140.H; FCL.140.S; FCL.140.B - Recency requirements

Training flight items should be based on the exercise items of the proficiency check, as deemed relevant by the instructor, and depending on the experience of the candidate. For aeroplanes and helicopters, the briefing should include a discussion on TEM with special emphasis on decision-making when encountering adverse meteorological conditions or unintentional IMC, as well as on navigation flight capabilities. For gliders and balloons, the discussion should place special emphasis on principal occurrence categories of the activity that is covered by the licence.

AMCs and GM to SECTION 4 - Specific requirements for the LAPL for gliders - LAPL (G)

AMC1 FCL.110.S LAPL(G) - Experience requirements and crediting

CREDITING: PRE-ENTRY FLIGHT TEST

The pre-entry flight test referred to in FCL.110.S(c) should cover the total content of the syllabus of flight instruction for the issuance of the LAPL(G), in accordance with AMC1 FCL.110.S and FCL.210.S.

AMC1 FCL.110.S; FCL.210.S

FLIGHT INSTRUCTION FOR THE LAPL(G) AND THE GPL

(a) Entry to training

Before being accepted for training an applicant should be informed that the appropriate medical certificate must be obtained before solo flying is permitted.

(b) Flight instruction

(1) The LAPL (G) and GPL flight instruction syllabus should take into account the principles of threat and error management and also cover:

(i) pre-flight operations, including verifying mass and balance, aircraft inspection and servicing, airspace and weather briefing;

(ii) aerodrome and traffic pattern operations, collision avoidance precautions and procedures;

(iii) control of the aircraft by external visual reference;

(iv) flight at high angle of attack (critically low air speeds), recognition of, and recovery from, incipient and full stalls and spins;

(v) flight at critically high air speeds, recognition of, and recovery from spiral dive;

(vi) normal and crosswind take-offs in respect with the different launch methods;

(vii) normal and crosswind landings;

(viii) short field landings and outlandings: field selection, circuit and landing hazards and precautions;

(ix) cross-country flying using visual reference, dead reckoning and available navigation aids;

(x) soaring techniques as appropriate to site conditions;

(xi) emergency actions;

(xii) compliance with air traffic services procedures and communication procedures.

(2) Before allowing the applicant to undertake his/her first solo flight, the FI should ensure that the applicant can operate the required systems and equipment.

(c) Syllabus of flight instruction

(1) The numbering of exercises should be used primarily as an exercise reference list and as a broad instructional sequencing guide; therefore the demonstrations and practices need not necessarily be given in the order listed. The actual order and content will depend upon the following interrelated factors:

(i) the applicant's progress and ability;

(ii) the weather conditions affecting the flight;

(iii) the flight time available;

(iv) instructional technique considerations;

(v) the local operating environment;

(vi) applicability of the exercises to the glider type.

(2) At the discretion of the instructors some of the exercises may be combined and some other exercises may be done in several flights.

(3) At least the exercises 1 to 12 have to be completed before the first solo flight.

(4) Each of the exercises involves the need for the applicant to be aware of the needs for good airmanship and look-out, which should be emphasised at all times.

(i) Exercise 1: Familiarisation with the glider:

(A) characteristics of the glider;

(B) cockpit layout: instruments and equipment;

(C) light controls: stick, pedals, airbrakes, flaps and trim;

(D) cable release and undercarriage;

(E) checklists, drills and controls.

(ii) Exercise 2: Procedures if emergencies:

(A) use of safety equipment (parachute);

(B) action if system failures;

(C) bail-out procedures.

(iii) Exercise 3: Preparation for flight:

(A) pre-flight briefings;

(B) required documents on board;

(C) equipment required for the intended flight;

(D) ground handling, movements, tow out, parking and security;

(E) pre-flight external and internal checks;

(F) verifying in-limits mass and balance;

(G) harness, seat or rudder panel adjustments;

(H) passenger handling;

(I) pre-launch checks.

(iv) Exercise 4: Initial air experience:

(A) area familiarisation;

(B) look-out procedures.

(v) Exercise 5: Effects of controls:

(A) look-out procedures;

(B) use of visual references;

(C) primary effects when laterally level and when banked;

(D) reference attitude and effect of elevator;

(E) relationship between attitude and speed;

(F) effects of:

(a) flaps (if available);

(b) airbrakes.

(vi) Exercise 6: Coordinated rolling to and from moderate angles of bank:

(A) look-out procedures;

(B) further effects of aileron (adverse yaw) and rudder (roll);

(C) coordination;

(D) rolling to and from moderate angles of bank and return to straight flight.

(vii) Exercise 7: Straight flying:

(A) look-out procedures;

(B) maintaining straight flight;

(C) flight at critically high air speeds;

(D) demonstration of inherent pitch stability;

(E) control in pitch, including use of trim;

(F) lateral level, direction and balance and trim;

(G) air speed: instrument monitoring and control.

(viii) Exercise 8: Turning:

(A) look-out procedures;

(B) demonstration and correction of adverse yaw;

(C) entry to turn (medium level turns);

(D) stabilising turns;

(E) exiting turns;

(F) faults in the turn (slipping and skidding);

(G) turns on to selected headings and use of compass;

(H) use of instruments (ball indicator or slip string) for precision.

(ix) Exercise 9a: Slow flight:

Note: the objective is to improve the student's ability to recognise inadvertent flight at critically low speeds (high angle of attack) and to provide practice in maintaining the glider in balance while returning to normal attitude (speed).

(A) safety checks;

(B) introduction to characteristics of slow flight;

(C) controlled flight down to critically high angle of attack (slow air speed).

(x) Exercise 9b: Stalling:

(A) safety checks;

(B) pre-stall symptoms, recognition and recovery;

(C) stall symptoms, recognition and recovery;

(D) recovery when a wing drops;

(E) approach to stall in the approach and in the landing configurations;

(F) recognition and recovery from accelerated stalls.

(xi) Exercise 10: Spin recognition and spin avoidance:

(A) safety checks;

(B) stalling and recovery at the incipient spin stage (stall with excessive wing drop, about 45°);

(C) entry into fully developed spins (if suitable training aircraft available);

(D) recognition of full spins (if suitable training aircraft available);

(E) standard spin recovery (if suitable training aircraft available);

(F) instructor induced distractions during the spin entry (if suitable training aircraft available).

Note: consideration of manoeuvre limitations and the need to refer to the glider manual and mass and balance calculations. If no suitable training aircraft is available to demonstrate the fully developed spin, all the aspects related to these training items have to be covered by specific theoretical instruction.

(xii) Exercise 11: Take-off or launch methods:

At least one launch method must be taught containing all the subjects below.

(xiii) Exercise 11a: Winch launch:

(A) signals or communication before and during launch;

(B) use of the launching equipment;

(C) pre-take-off checks;

(D) into wind take-off;

(E) crosswind take-off;

(F) optimum profile of winch launch and limitations;

(G) release procedures;

(H) launch failure procedures.

(xiv) Exercise 11b: Aero tow:

(A) signals or communication before and during launch;

(B) use of the launch equipment;

(C) pre-take-off checks;

(D) into wind take-off;

(E) crosswind take-off;

(F) on tow: straight flight, turning and slip stream;

(G) out of position in tow and recovery;

(H) descending on tow (towing aircraft and glider);

(I) release procedures;

(J) launch failure and abandonment.

(xv) Exercise 11c: Self-launch:

(A) engine extending and retraction procedures;

(B) engine starting and safety precautions;

(C) pre-take-off checks;

(D) noise abatement procedures;

(E) checks during and after take-off;

(F) into wind take-off;

(G) crosswind take-off;

(H) power failures and procedures;

(I) abandoned take-off;

(J) maximum performance (short field and obstacle clearance) take-off;

(K) short take-off and soft field procedure or techniques and performance calculations.

(xvi) Exercise 11d: Car launch:

(A) signals before and during launch;

(B) use of the launch equipment;

(C) pre-take-off checks;

(D) into wind take-off;

(E) crosswind take-off;

(F) optimum launch profile and limitations;

(G) release procedures;

(H) launch failure procedures.

(xvii) Exercise 11e: Bungee launch:

(A) signals before and during launch;

(B) use of the launch equipment;

(C) pre-take-off checks;

(D) into wind take-off.

(xviii) Exercise 12: Circuit, approach and landing:

(A) procedures for re-joining the circuit;

(B) collision avoidance, look-out techniques and procedures;

(C) pre-landing checks: circuit procedures, downwind and base leg;

(D) effect of wind on approach and touchdown speeds;

(E) use of flaps (if applicable);

(F) visualisation of an aiming point;

(G) approach control and use of airbrakes;

(H) normal and crosswind approach and landing;

(I) short landing procedures or techniques.

(xix) Exercise 13: First solo:

(A) instructor's briefing including limitations;

(B) awareness of local area and restrictions;

(C) use of required equipment;

(D) observation of flight and debriefing by instructor.

(xx) Exercise 14: Advanced turning:

(A) steep turns (45°);

(B) stalling and spin avoidance in the turn and recovery;

(C) recoveries from unusual attitudes, including spiral dives.

(xxi) Exercise 15: Soaring techniques:

At least one of the three soaring techniques must be taught containing all subjects below.

(xxii) Exercise 15a: Thermalling:

(A) look-out procedures;

(B) detection and recognition of thermals;

(C) use of audio soaring instruments;

(D) joining a thermal and giving way;

(E) flying in close proximity to other gliders;

(F) centring in thermals;

(G) leaving thermals.

(xxiii) Exercise 15b: Ridge flying:

(A) look-out procedures;

(B) practical application of ridge flying rules;

(C) optimisation of flight path;

(D) speed control.

(xxiv) Exercise 15C: Wave flying:

(A) look-out procedures;

(B) wave access techniques;

(C) speed limitations with increasing height;

(D) use of oxygen.

(xxv) Exercise 16: Out-landings:

(A) gliding range;

(B) restart procedures (only for self-launching and self-sustaining gliders);

(C) selection of landing area;

(D) circuit judgement and key positions;

(E) circuit and approach procedures;

(F) actions after landing.

(xxvi) Exercise 17: Cross-country flying:

If the required cross-country flight will be conducted as a solo cross-country flight, all the subjects below must be taught before.

(xxvii) Exercise 17a: Flight planning:

(A) weather forecast and actuals;

(B) NOTAMs and airspace considerations;

(C) map selection and preparation;

(D) route planning;

(E) radio frequencies (if applicable);

(F) pre-flight administrative procedure;

(G) flight plan where required;

(H) mass and performance;

(I) alternate aerodromes and landing areas;

(J) safety altitudes.

(xxviii) Exercise 17b: In-flight navigation:

(A) maintaining track and re-routing considerations;

(B) use of radio and phraseology (if applicable);

(C) in-flight planning;

(D) procedures for transiting regulated airspace or ATC liaison where required;

(E) uncertainty of position procedure;

(F) lost procedure;

(G) use of additional equipment where required;

(H) joining, arrival and circuit procedures at remote aerodrome.

(xxix) Exercise 17c: Cross-country techniques:

(A) look-out procedures;

(B) maximising potential cross-country performance;

(C) risk reduction and threat reaction.

AMC1 FCL.135.S; FCL.205.S (a)

EXTENSION OF PRIVILEGES TO TMG: LAPL(G) AND GPL

(a) The aim of the flight training is to qualify LAPL(G) or GPL holders to exercise the privileges of the licence on a TMG.

(b) The ATO should issue a certificate of satisfactory completion of the training.

(c) Theoretical knowledge

(d) The theoretical knowledge syllabus should cover the revision or explanation of:

(1) Principles of flight:

(i) operating limitations (addition TMG);

(ii) propellers;

(iii) flight mechanics.

(2) Operational procedures for TMG:

(i) special operational procedures and hazards;

(ii) emergency procedures.

(3) Flight performance and planning:

(i) mass and balance considerations;

(ii) loading;

(iii) CG calculation;

(iv) load and trim sheet;

(v) performance of TMGs;

(vi) flight planning for VFR flights;

(vii) fuel planning;

(viii) pre-flight preparation;

(ix) ICAO flight plan;

(x) flight monitoring and in-flight re-planning.

(4) Aircraft general knowledge:

(i) system designs, loads, stresses, maintenance;

(ii) airframe;

(iii) landing gear, wheels, tyres, brakes;

(iv) fuel system;

(v) electrics;

(vi) piston engines;

(vii) propellers;

(viii) instrument and indication systems.

(5) Navigation:

(i) dead reckoning navigation (addition powered flying elements);

(ii) in-flight navigation (addition powered flying elements);

(iii) basic radio propagation theory;

(iv) radio aids (basics);

(v) radar (basics);

(vi) GNSS.

(e) Flight instruction

(1) The numbering of exercises should be used primarily as an exercise reference list and as a broad instructional sequencing guide; therefore the demonstrations and practices need not necessarily be given in the order listed.

(2) The flying exercises should cover the revision or explanation of the following exercises:

(i) Exercise 1: Familiarisation with the TMG:

(A) characteristics of the TMG;

(B) cockpit layout;

(C) systems;

(D) checklists, drills and controls.

(ii) Exercise 1e: Emergency drills:

(A) action if fire on the ground and in the air;

(B) engine cabin and electrical system fire;

(C) systems failure;

(D) escape drills, location and use of emergency equipment and exits.

(iii) Exercise 2: Preparation for and action after flight:

(A) serviceability documents;

(B) equipment required, maps, etc.;

(C) external checks;

(D) internal checks;

(E) harness and seat or rudder panel adjustments;

(F) starting and warm-up checks;

(G) power checks;

(H) running down system checks and switching off the engine;

(I) parking, security and picketing (for example tie down);

(J) completion of authorisation sheet and serviceability documents.

(iv) Exercise 3: Taxiing:

(A) pre-taxi checks;

(B) starting, control of speed and stopping;

(C) engine handling;

(D) control of direction and turning;

(E) turning in confined spaces;

(F) parking area procedure and precautions;

(G) effects of wind and use of flying controls;

(H) effects of ground surface;

(I) freedom of rudder movement;

(J) marshalling signals;

(K) instrument checks;

(L) air traffic control procedures (if applicable).

(v) Exercise 3e: Emergencies: brake and steering failure.

(vi) Exercise 4: Straight and level:

(A) at normal cruising power, attaining and maintaining straight and level flight;

(B) flight at critically high air speeds;

(C) demonstration of inherent stability;

(D) control in pitch, including use of trim;

(E) lateral level, direction and balance and trim;

(F) at selected air speeds (use of power);

(G) during speed and configuration changes;

(H) use of instruments for precision.

(vii) Exercise 5: Climbing:

(A) entry, maintaining the normal and max rate climb and levelling off;

(B) levelling off at selected altitudes;

(C) en-route climb (cruise climb);

(D) climbing with flap down;

(E) recovery to normal climb;

(F) maximum angle of climb;

(G) use of instruments for precision.

(viii) Exercise 6: Descending:

(A) entry, maintaining and levelling off;

(B) levelling off at selected altitudes;

(C) glide, powered and cruise descent (including effect of power and air speed);

(D) side slipping (on suitable types);

(E) use of instruments for precision flight.

(ix) Exercise 7: Turning:

(A) entry and maintaining medium level turns;

(B) resuming straight flight;

(C) faults in the turn (incorrect pitch, bank and balance);

(D) climbing turns;

(E) descending turns;

(F) slipping turns (on suitable types);

(G) turns onto selected headings, use of gyro heading indicator or compass;

(H) use of instruments for precision.

(x) Exercise 8a: Slow flight:

Note: the objective is to improve the pilot's ability to recognise inadvertent flight at critically low speeds and provide practice in maintaining the TMG in balance while returning to normal air speed.

(A) safety checks;

(B) introduction to slow flight;

(C) controlled flight down to critically slow air speed;

(D) application of full power with correct attitude and balance to achieve normal climb speed.

(xi) Exercise 8b: Stalling:

(A) airmanship;

(B) safety checks;

(C) symptoms;

(D) recognition;

(E) clean stall and recovery without power and with power;

(F) recovery when a wing drops;

(G) approach to stall in the approach and in the landing configurations, with and without power, recovery at the incipient stage.

(xii) Exercise 9: Take-off and climb to downwind position:

(A) pre-take-off checks;

(B) into wind take-off;

(C) safeguarding the nose wheel (if applicable);

(D) crosswind take-off;

(E) drills during and after take-off;

(F) short take-off and soft field procedure or techniques including performance calculations;

(G) noise abatement procedures.

(xiii) Exercise 10: Circuit, approach and landing:

(A) circuit procedures, downwind and base leg;

(B) powered approach and landing;

(C) safeguarding the nose wheel (if applicable);

(D) effect of wind on approach and touchdown speeds;

(E) use of airbrakes, flaps, slats or spoilers;

(F) crosswind approach and landing;

(G) glide approach and landing (engine stopped);

(H) short landing and soft field procedures or techniques;

(I) flapless approach and landing (if applicable);

(J) wheel landing (tail wheel aeroplanes);

(K) missed approach and go-around;

(L) noise abattement procedures.

(xiv) Exercise 9/10e: Emergencies:

(A) abandoned take-off;

(B) engine failure after take-off;

(C) mislanding and go-around;

(D) missed approach.

Note: in the interests of safety it will be necessary for pilots trained on nose wheel TMGs to undergo dual conversion training before flying tail wheel TMGs, and vice versa.

(xv) Exercise 11: Advanced turning:

(A) steep turns (45 °), level and descending;

(B) stalling in the turn and recovery;

(C) recoveries from unusual attitudes, including spiral dives.

(xvi) Exercise 12: Stopping and restarting the engine:

(A) engine cooling procedures;

(B) switching off procedure in-flight;

(C) glider operating procedures;

(D) restarting procedure.

(xvii) Exercise 13: Forced landing without power:

(A) forced landing procedure;

(B) choice of landing area, provision for change of plan;

(C) gliding distance;

(D) descent plan;

(E) key positions;

(F) engine failure checks;

(G) use of radio;

(H) base leg;

(I) final approach;

(J) landing;

(K) actions after landing.

(xviii) Exercise 14: Precautionary landing:

(A) full procedure away from aerodrome to break-off height;

(B) occasions necessitating;

(C) in-flight conditions;

(D) landing area selection:

(a) normal aerodrome;

(b) disused aerodrome;

(c) ordinary field.

(E) circuit and approach;

(F) actions after landing.

(xix) Exercise 15a: Navigation

(A) Flight planning

(a) weather forecast and actuals;

(b) map selection and preparation:

(1) choice of route;

(2) airspace structure;

(3) safety altitudes.

(c) calculations:

(1) magnetic heading(s) and time(s) en-route;

(2) fuel consumption;

(3) mass and balance;

(4) mass and performance.

(d) flight information:

(1) NOTAMs, etc.;

(2) radio frequencies;

(3) selection of alternate aerodromes.

(e) TMG documentation;

(f) notification of the flight:

(1) pre-flight administrative procedures;

(2) flight plan form.

(B) Departure:

(a) organisation of cockpit workload;

(b) departure procedures:

(1) altimeter settings;

(2) ATC liaison in regulated airspace;

(3) setting heading procedure;

(4) noting of ETAs.

(C) En-route:

(a) maintenance of altitude and heading;

(b) revisions of ETA and heading;

(c) log keeping;

(d) use of radio or compliance with ATC procedures;

(e) minimum weather conditions for continuation of flight;

(f) in-flight decisions;

(g) transiting controlled or regulated airspace;

(h) diversion procedures;

(i) uncertainty of position procedure;

(j) lost procedure.

(D) Arrival, aerodrome joining procedure:

(a) ATC liaison in regulated airspace;

(b) altimeter setting;

(c) entering the traffic pattern;

(d) circuit procedures;

(e) parking;

(f) security of TMG;

(g) refuelling;

(h) closing of flight plan, if appropriate;

(i) post-flight administrative procedures.

(xx) Exercise 15b: Navigation problems at lower levels and in reduced visibility:

(A) actions before descending;

(B) hazards (for example obstacles and terrain);

(C) difficulties of map reading;

(D) effects of wind and turbulence;

(E) vertical situational awareness (avoidance of controlled flight into terrain);

(F) avoidance of noise sensitive areas;

(G) joining the circuit;

(H) bad weather circuit and landing.

(xxi) Exercise 15c: Radio navigation (basics):

(A) Use of GNSS or VOR/NDB;

(a) selection of waypoints;

(b) to or from indications or orientation;

(c) error messages.

(B) Use of VHF/DF:

(a) availability, AIP and frequencies;

(b) R/T procedures and ATC liaison;

(c) obtaining a QDM and homing.

(C) Use of en-route or terminal radar:

(a) availability and AIP;

(b) procedures and ATC liaison;

(c) pilot's responsibilities;

(d) secondary surveillance radar;

(1) transponders;

(2) code selection;

(3) interrogation and reply.

AMC1 FCL.140.A; FCL.140.H; FCL.140.S; FCL.140.B Recency requirements

Training flight items should be based on the exercise items of the proficiency check, as deemed relevant by the instructor, and depending on the experience of the candidate. For aeroplanes and helicopters, the briefing should include a discussion on TEM with special emphasis on decision-making when encountering adverse meteorological conditions or unintentional IMC, as well as on navigation flight capabilities. For gliders and balloons, the discussion should place special emphasis on principal occurrence categories of the activity that is covered by the licence.

AMCs and GM to SECTION 5 - Specific requirements for the LAPL for balloons - LAPL (B)

AMC1 FCL.110.B LAPL (B) - Experience requirements and crediting

CREDITING: PRE-ENTRY FLIGHT TEST

The pre-entry flight test referred to in FCL.110.B (b) should cover the total content of the syllabus of flight instruction for the issuance of the LAPL(B), in accordance with AMC1 FCL.110.B and FCL.210.B.

AMC1 FCL.110.B; FCL.210.B

FLIGHT INSTRUCTION FOR THE LAPL (B) AND FLIGHT INSTRUCTION FOR THE BPL

(a) Entry to training

Before being accepted for training an applicant should be informed that the appropriate medical certificate must be obtained before solo flying is permitted.

(b) Flight instruction

(1) The LAPL (B) or BPL flight instruction syllabus should take into account the principles of threat and error management and also cover:

(i) pre-flight operations, including load calculations, balloon inspection and servicing;

(ii) crew and passenger briefings;

(iii) inflation and crowd control;

(iv) control of the balloon by external visual reference;

(v) take-off in different wind conditions;

(vi) approach from low and high level;

(vii) landings in different surface wind conditions;

(viii) cross-country flying using visual reference and dead reckoning;

(ix) emergency operations, including simulated balloon equipment malfunctions;

(x) compliance with air traffic services procedures and communication procedures;

(xi) avoidance of nature protection areas, landowner relations.

(2) Before allowing the applicant to undertake his/her first solo flight, the FI should ensure that the applicant can operate the required systems and equipment.

(c) Syllabus of flight instruction (hot-air balloon)

(1) The numbering of exercises should be used primarily as an exercise reference list and as a broad instructional sequencing guide; therefore the demonstrations and practices need not necessarily be given in the order listed. The actual order and content will depend upon the following interrelated factors:

(i) the applicant's progress and ability;

(ii) the weather conditions affecting the flight;

(iii) the flight time available;

(iv) instructional technique considerations;

(v) the local operating environment;

(vi) applicability of the exercises to the balloon type.

(2) Each of the exercises involves the need for the applicant to be aware of the needs of good airmanship and look-out, which should be emphasised at all times.

(i) Exercise 1: Familiarisation with the balloon:

(A) characteristics of the balloon;

(B) the components or systems;

(C) re-fuelling of the cylinders;

(D) instruments and equipment;

(E) use of checklist(s) and procedures.

(ii) Exercise 2: Preparation for flight:

(A) documentation and equipment;

(B) weather forecast and actuals;

(C) flight planning:

(a) NOTAMs

(b) airspace structure;

(c) sensitive areas (for example nature protection areas);

(d) expected track and distance;

(e) pre-flight picture;

(f) possible landing fields.

(D) launch field:

(a) permission;

(b) field selection;

(c) behaviour;

(d) adjacent fields.

(E) load calculations.

(iii) Exercise 3: Crew and passenger briefing:

(A) clothing;

(B) crew briefing;

(C) passenger briefing.

(iv) Exercise 4: Assembly and layout:

(A) crowd control;

(B) rigging envelope, basket and burner;

(C) burner test;

(D) use of restraint line;

(E) pre-inflation checks.

(v) Exercise 5: Inflation:

(A) crowd control;

(B) cold inflation;

(C) use of the inflation fan;

(D) hot inflation.

(vi) Exercise 6: Take-off in different wind conditions:

(A) pre take-off checks and briefings;

(B) heating for controlled climb;

(C) 'hands off and hands on' procedure for ground crew;

(D) assessment of lift;

(E) use of quick release;

(F) assessment of wind and obstacles;

(G) take-off in wind without shelter obstacles;

(H) preparation for false lift.

(vii) Exercise 7: Climb to level flight:

(A) climbing with a predetermined rate of climb;

(B) look-out procedures;

(C) effect on envelope temperature;

(D) maximum rate of climb according to manufacturer's flight manual;

(E) levelling off at selected altitude.

(viii) Exercise 8: Level flight:

(A) maintaining level flight by:

(a) use of instruments only;

(b) use of visual references only;

(c) all available means.

(B) use of parachute and turning vents (if applicable).

(ix) Exercise 9: Descent to level flight:

(A) descent with a predetermined rate of descent;

(B) fast descent;

(C) look-out procedures;

(D) maximum rate of descent according to manufacturer's flight manual;

(E) use of parachute;

(F) parachute stall;

(G) cold descent;

(H) levelling off at selected altitude.

(x) Exercise 10: Emergencies – systems:

(A) pilot light failure;

(B) burner failure, valve leaks, flame out and re-light;

(C) gas leaks;

(D) envelope over temperature;

(E) envelope damage in-flight;

(F) parachute or rapid deflation system failure.

(xi) Exercise 10B: Other emergencies:

(A) fire extinguisher;

(B) fire on ground;

(C) fire in the air;

(D) contact with electrical power lines;

(E) obstacle avoidance;

(F) escape drills, location and use of emergency equipment.

(xii) Exercise 11: Navigation:

(A) maps selection;

(B) plotting expected track;

(C) marking positions and time;

(D) calculation of distance, speed and fuel consumption;

(E) ceiling limitations (ATC, weather and envelope temperature);

(F) planning ahead;

(G) monitoring of weather development and acting so;

(H) monitoring of fuel consumption and envelope temperature;

(I) ATC liaison (if applicable);

(J) communication with retrieve crew;

(K) use of GNSS (if applicable).

(xiii) Exercise 12: Fuel management:

(A) cylinder arrangement and burner systems;

(B) pilot light supply (vapour or liquid);

(C) use of master cylinders (if applicable);

(D) fuel requirement and expected fuel consumption;

(E) fuel state and pressure;

(F) fuel reserves;

(G) cylinder contents gauge and change procedure;

(H) use of cylinder manifolds.

(xiv) Exercise 13: Approach from low level:

(A) pre-landing checks;

(B) passenger pre-landing briefing;

(C) selection of field;

(D) use of burner and parachute;

(E) look-out procedures;

(F) missed approach and fly on.

(xv) Exercise 14: Approach from high level:

(A) pre-landing checks;

(B) passenger pre-landing briefing;

(C) selection of field;

(D) rate of descent;

(E) use of burner and parachute;

(F) look-out procedures;

(G) missed approach and fly on.

(xvi) Exercise 15: Operating at low level:

(A) use of burner, whisper burner and parachute;

(B) look-out procedures;

(C) avoidance of low level obstacles;

(D) avoidance of protection areas;

(E) landowner relations.

(xvii) Exercise 16: Landing in different wind conditions:

(A) pre-landing checks;

(B) passenger pre-landing briefing;

(C) selection of field;

(D) turbulences (in the case of landings with high wind speed only);

(E) use of burner and pilot lights;

(F) use of parachute and turning vents (if applicable);

(G) look-out procedures;

(H) dragging and deflation;

(I) landowner relations;

(J) airmanship.

(xviii) Exercise 17: First solo:

(A) supervised flight preparation;

(B) instructor's briefing, observation of flight and de-briefing.

(d) Syllabus of flight instruction (gas balloon)

(1) The numbering of exercises should be used primarily as an exercise reference list and as a broad instructional sequencing guide; therefore the demonstrations and practices need not necessarily be given in the order listed. The actual order and content will depend upon the following interrelated factors:

(i) the applicant's progress and ability;

(ii) the weather conditions affecting the flight;

(iii) the flight time available;

(iv) instructional technique considerations;

(v) the local operating environment;

(vi) applicability of the exercises to the balloon type.

(2) Each of the exercises involves the need for the pilot-under-training to be aware of the needs of good airmanship and look-out, which should be emphasised at all times.

(i) Exercise 1: Familiarisation with the balloon:

(A) characteristics of the balloon;

(B) the components or systems;

(C) instruments and equipment;

(D) use of checklist(s) and procedures.

(ii) Exercise 2: Preparation for flight:

(A) documentation and equipment

(B) weather forecast and actuals;

(C) flight planning:

(a) NOTAMs;

(b) airspace structure;

(c) sensitive areas (for example nature protection areas);

(d) expected track and distance;

(e) pre-flight picture;

(f) possible landing fields.

(D) launch field:

(a) permission;

(b) behaviour;

(c) adjacent fields.

(E) load calculations.

(iii) Exercise 3: Crew and passenger briefing:

(A) clothing;

(B) crew briefings;

(C) passenger briefing.

(iv) Exercise 4: Assembly and layout:

(A) crowd control;

(B) rigging envelope and basket (balloon with net);

(C) rigging envelope and basket (netless balloon);

(D) ballast check.

(v) Exercise 5: Inflation:

(A) crowd control;

(B) inflation procedure according to manufacturer's flight manual;

(C) avoiding electrostatic discharge.

(vi) Exercise 6: Take-off in different wind conditions:

(A) pre take-off checks and briefings;

(B) prepare for controlled climb;

(C) 'hands off and hands on' procedure for ground crew;

(D) assessment of wind and obstacles;

(E) preparation for false lift.

(vii) Exercise 7: Climb to level flight:

(A) climb with a predetermined rate of climb;

(B) look-out procedures;

(C) maximum rate of climb according to manufacturer's flight manual;

(D) levelling off at selected altitude.

(viii) Exercise 8: Level flight:

(A) maintaining level flight by:

(a) use of instruments only;

(b) use of visual references only;

(c) all available means.

(B) use of parachute or valve.

(ix) Exercise 9: Descent to level flight:

(A) descent with a predetermined rate of descent;

(B) fast descent;

(C) look-out procedures;

(D) maximum rate of descent according to manufacturer's flight manual;

(E) use of parachute or valve;

(F) levelling off at selected altitude.

(x) Exercise 10: Emergencies:

(A) closed appendix during take-off and climb;

(B) envelope damage in-flight;

(C) parachute or valve failure;

(D) contact with electrical power lines;

(E) obstacle avoidance;

(F) escape drills, location and use of emergency equipment.

(xi) Exercise 11: Navigation:

(A) map selection;

(B) plotting expected track;

(C) marking positions and time;

(D) calculation of distance, speed and ballast consumption;

(E) ceiling limitations (ATC, weather and ballast);

(F) planning ahead;

(G) monitoring of weather development and acting so;

(H) monitoring of ballast consumption;

(I) ATC liaison (if applicable);

(J) communication with retrieve crew;

(K) use of GNSS (if applicable).

(xii) Exercise 12: Ballast management:

(A) minimum ballast;

(B) arrangement and securing of ballast;

(C) ballast requirement and expected ballast consumption;

(D) ballast reserves.

(xiii) Exercise 13: Approach from low level:

(A) pre-landing checks;

(B) passenger pre-landing checks;

(C) selection of field;

(D) use of ballast and parachute or valve;

(E) use of trail rope (if applicable);

(F) look-out procedures;

(G) missed approach and fly on.

(xiv) Exercise 14: Approach from high level:

(A) pre-landing checks;

(B) passenger pre-landing checks;

(C) selection of field;

(D) rate of descent;

(E) use of ballast and parachute or valve;

(F) use of trail rope (if applicable);

(G) look-out procedures;

(H) missed approach and fly on.

(xv) Exercise 15: Operating at low level:

(A) use of ballast and parachute or valve;

(B) look-out procedures;

(C) avoidance of low level obstacle;

(D) avoidance of protection areas;

(E) landowner relations.

(xvi) Exercise 16: Landing in different wind conditions:

(A) pre-landing checks;

(B) passenger pre-landing briefing;

(C) selection of field;

(D) turbulences (in the case of landings with high wind speed only);

(E) use of ballast and parachute or valve;

(F) look-out procedures;

(G) use of rip panel;

(H) dragging;

(I) deflation;

(J) avoiding electrostatic discharge;

(K) landowner relations.

(xvii) Exercise 17: First solo:

Note: the exercises 1 to 16 have to be completed and the student must have achieved a safe and competent level before the first solo flight takes place.

(A) supervised flight preparation;

(B) instructor's briefing, observation of flight and de-briefing.

AMC1 FCL.130.B; FCL.220.B

FLIGHT INSTRUCTION FOR THE EXTENSION OF PRIVILEGES TO TETHERED FLIGHTS

(a) The aim of the flight instruction is to qualify LAPL (B) or BPL holders to perform tethered flights.

(b) The flying exercise should cover the following training items:

(1) ground preparations;

(2) weather suitability;

(3) tether points:

(i) upwind;

(ii) downwind.

(4) tether ropes (three point system);

(5) maximum all-up-weight limitation;

(6) crowd control;

(7) pre take-off checks and briefings;

(8) heating for controlled lift off;

(9) 'hands off and hands on' procedure for ground crew;

(10) assessment of lift;

(11) assessment of wind and obstacles;

(12) take-off and controlled climb (at least up to 60 ft – 20m).

AMC1 FCL.135.B; FCL.225.B

THEORETICAL KNOWLEDGE INSTRUCTION FOR THE EXTENSION TO ANOTHER BALLOON CLASS: LAPL (B) AND BPL

(a) The aim of the flight instruction is to qualify LAPL (B) or BPL holders to exercise the privileges on a different class of balloons.

(b) The following classes are recognised:

(1) hot-air balloons;

(2) gas balloons;

(3) hot-air airships.

(c) The ATO should issue a certificate of satisfactory completion of the instruction to licence endorsement.

(d) Theoretical knowledge

The theoretical knowledge syllabus should cover the revision or explanation of:

(1) principles of flight:

(i) operating limitations;

(ii) loading limitations.

(2) operational procedures:

(i) special operational procedures and hazards;

(ii) emergency procedures.

(3) flight performance and planning:

(i) mass considerations;

(ii) loading;

(iii) performance (hot-air balloon, gas balloon or hot-air airship);

(iv) flight planning;

(v) fuel planning;

(vi) flight monitoring.

(4) aircraft general knowledge:

(i) system designs, loads, stresses and maintenance;

(ii) envelope;

(iii) burner (only extension to hot-air balloon or airship);

(iv) fuel cylinders (except gas balloon);

(v) basket or gondola;

(vi) lifting or burning gas;

(vii) ballast (only gas balloon);

(viii) engine (only hot-air airship);

(ix) instruments and indication systems;

(x) emergency equipment.

AMC2 FCL.135.B; FCL.225.B

FLIGHT INSTRUCTION FOR THE EXTENSION TO ANOTHER BALLOON CLASS: LAPL (B) AND BPL

(a) This additional syllabus of flight instruction should be used for the extension of privileges for LAPL (B) and BPL - hot-air balloon to hot-air airship.

(b) The prerequisite for the extension of privileges to hot-air airships is a valid BPL or LAPL for hot-air balloons because a hot-air airship with a failed engine must be handled in a similar manner as a hot-air balloon. The conversion training has to concentrate therefore on the added complication of the engine, its controls and the different operating limitations of a hot-air airship.

(1) The numbering of exercises should be used primarily as an exercise reference list and as a broad instructional sequencing guide; therefore the demonstrations and practices need not necessarily be given in the order listed.

(2) The flying exercises should cover the revision or explanation of the following exercises:

(i) Exercise 1: Familiarisation with the hot-air airship:

(A) characteristics of the hot-air airship;

(B) the components or systems;

(C) instruments and equipment;

(D) use of checklist(s) and procedures.

(ii) Exercise 2: Preparation for flight:

(A) documentation and equipment;

(B) weather forecast and actuals;

(C) flight planning:

(a) NOTAMs;

(b) airspace structure;

(c) sensitive areas;

(d) expected track and distance;

(e) pre-flight picture;

(f) possible landing fields.

(D) launch field:

(a) permission;

(b) behaviour;

(c) field selection;

(d) adjacent fields.

(E) load and fuel calculations.

(iii) Exercise 3: Crew and passenger briefing:

(A) clothing;

(B) crew briefing;

(C) passenger briefing.

(iv) Exercise 4: Assembly and layout:

(A) crowd control;

(B) rigging envelope, gondola, burner and engine;

(C) burner test;

(D) pre-inflation checks.

(v) Exercise 5: Inflation:

(A) crowd control;

(B) cold inflation:

(a) use of restraint line;

(b) use of the inflation fan.

(C) hot inflation.

(vi) Exercise 6: Engine:

(A) identification of main parts and controls;

(B) familiarisation with operation and checking of the engine;

(C) engine checks before take-off.

(vii) Exercise 7: Pressurisation:

(A) pressurisation fan operation;

(B) super pressure and balance between pressure and temperature;

(C) pressure limitations.

(viii) Exercise 8: Take-off:

(A) before take-off checks and briefings;

(B) heating for controlled climb;

(C) procedure for ground crew;

(D) assessment of wind and obstacles.

(ix) Exercise 9: Climb to level flight:

(A) climbing with a predetermined rate of climb;

(B) effect on envelope temperature and pressure;

(C) maximum rate of climb according to manufacturer's flight manual;

(D) level off at selected altitude.

(x) Exercise 10: Level flight:

(A) maintaining level flight by:

(a) use of instruments only;

(b) use of visual references only;

(c) all available means.

(B) maintaining level flight at different air speeds by taking aerodynamic lift into account.

(xi) Exercise 11: Descent to level flight:

(A) descent with a predetermined rate of descent;

(B) maximum rate of descent according to manufacturer's flight manual;

(C) levelling off at selected altitude.

(xii) Exercise 12: Emergencies - systems:

(A) engine failure;

(B) pressurisation failure;

(C) udder failure;

(D) pilot light failure;

(E) burner failure, valve leaks, flame out and re-light;

(F) gas leaks;

(G) envelope over temperature;

(H) envelope damage in-flight.

(xiii) Exercise 12B: Other emergencies:

(A) fire extinguishers;

(B) fire on ground;

(C) fire in the air;

(D) contact with electrical power lines;

(E) obstacle avoidance;

(F) escape drills, location and use of emergency equipment.

(xiv) Exercise 13: Navigation:

(A) map selection and preparation;

(B) plotting and steering expected track;

(C) marking positions and time;

(D) calculation of distance, speed and fuel consumption;

(E) ceiling limitations (ATC, weather and envelope temperature);

(F) planning ahead;

(G) monitoring of weather development and acting so;

(H) monitoring of fuel and envelope temperature or pressure;

(I) ATC liaison (if applicable);

(J) communication with ground crew;

(K) use of GNSS (if applicable).

(xv) Exercise 14: Fuel management:

(A) engine arrangement and tank system;

(B) cylinder arrangement and burner systems;

(C) pilot light supply (vapour or liquid);

(D) fuel requirement and expected fuel consumption for engine and burner;

(E) fuel state and pressure;

(F) fuel reserves;

(G) cylinder and petrol tank contents gauge.

(xvi) Exercise 15: Approach and go-around:

(A) pre-landing checks;

(B) selection of field into wind;

(C) use of burner and engine;

(D) look-out procedures;

(E) missed approach and go-around.

(xvii) Exercise 16: Approach with simulated engine failure:

(A) pre-landing checks;

(B) selection of field;

(C) use of burner;

(D) look-out procedures;

(E) missed approach and go-around.

(xviii) Exercise 17: Operating at low level:

(A) use of burner and engine;

(B) look-out procedures;

(C) avoidance of low level obstacles;

(D) avoidance of sensitive areas (nature protection areas) or landowner relations.

(xix) Exercise 18: Steering:

(A) assessment of wind;

(B) correcting for wind to steer a given course.

(xx) Exercise 19: Final landing:

(A) pre-landing checks;

(B) use of burner and engine;

(C) look-out;

(D) deflation;

(E) landowner relations.

AMC3 FCL.135.B; FCL.225.B

CONTENTS OF THE SKILL TEST FOR THE EXTENSION OF A LAPL(B) OR A BPL TO ANOTHER BALLOON CLASS (HOT-AIR AIRSHIP)

(a) The take-off site should be chosen by the applicant depending on the actual meteorological conditions, the area which has to be overflown and the possible options for suitable landing sites. The applicant should be responsible for the flight planning and should ensure that all equipment and documentation for the execution of the flight are on board.

(b) An applicant should indicate to the FE the checks and duties carried out. Checks should be completed in accordance with the flight manual or the authorised checklist for the balloon on which the test is being taken. During pre-flight preparation for the test the applicant should be required to perform crew and passenger briefings and demonstrate crowd control. The load calculation should be performed by the applicant in compliance with the operations manual or flight manual for the hot-air airship used.

FLIGHT TEST TOLERANCE

(c) The applicant should demonstrate the ability to:

(1) operate the hot-air airship within its limitations;

(2) complete all manoeuvres with smoothness and accuracy;

(3) exercise good judgment and airmanship;

(4) apply aeronautical knowledge;

(5) maintain control of the airship at all times in such a manner that the successful outcome of a procedure or manoeuvre is never seriously in doubt.

CONTENT OF THE SKILL TEST

(d) The skill test contents and sections set out in this AMC should be used for the skill test for the issue of a LAPL(B) and BPL hot-air airship extension.

SECTION 1 PRE-FLIGHT OPERATIONS, INFLATION AND TAKE-OFF	
Use of checklist, airmanship, control of hot-air airship by external visual reference, look-out procedures, etc. apply in all sections.	
a	Pre-flight documentation, flight planning, NOTAM and weather briefing
b	Hot-air airship inspection and servicing
c	Load calculation
d	Crowd control, crew and passenger briefings
e	Assembly and layout
f	Inflation and pre-take-off procedures
g	Take-off
h	ATC compliance (if applicable)
SECTION 2 GENERAL AIRWORK	

a	Climb to level flight
b	Level flight
c	Descent to level flight
d	Operating at low level
e	ATC compliance (if applicable)
SECTION 3 EN-ROUTE PROCEDURES	
a	Dead reckoning and map reading
b	Marking positions and time
c	Orientation and airspace structure
d	Plotting and steering expected track
e	Maintenance of altitude
f	Fuel management
g	Communication with ground crew
h	ATC compliance (if applicable)
SECTION 4 APPROACH AND LANDING PROCEDURES	
a	Approach, missed approach and go-around
b	Pre-landing checks
c	Selection of landing field
d	Landing and deflation
e	ATC compliance (if applicable)
f	Actions after flight
SECTION 5 ABNORMAL AND EMERGENCY PROCEDURES	
This section may be combined with Sections 1 through 4	
a	Simulated fire on the ground and in the air
b	Simulated pilot light-, burner- and engine-failure
c	Approach with simulated engine failure, missed approach and go-around
d	Other abnormal and emergency procedures as outlined in the appropriate flight manual
e	Oral questions

AMC1 FCL.140.A; FCL.140.H; FCL.140.S; FCL.140.B - Recency requirements

Training flight items should be based on the exercise items of the proficiency check, as deemed relevant by the instructor, and depending on the experience of the candidate. For aeroplanes and helicopters, the briefing should

include a discussion on TEM with special emphasis on decision-making when encountering adverse meteorological conditions or unintentional IMC, as well as on navigation flight capabilities. For gliders and balloons, the discussion should place special emphasis on principal occurrence categories of the activity that is covered by the licence.

SUBPART C - Private pilot licence (PPL), glider pilot licence (GPL) and balloon pilot licence (BPL)

AMCs and GM to SECTION 1 - Common requirements

AMC1 FCL.210.PPL(A) - Training course

FLIGHT INSTRUCTION FOR THE PPL(A)

(a) Entry to training

Before being accepted for training an applicant should be informed that the appropriate medical certificate must be obtained before solo flying is permitted.

(b) Flight instruction

(1) The PPL(A) flight instruction syllabus takes into account the principles of threat and error management and also covers:

(i) pre-flight operations, including mass and balance determination, aircraft inspection and servicing;

(ii) aerodrome and traffic pattern operations, collision avoidance precautions and procedures;

(iii) control of the aircraft by external visual reference;

(iv) flight at critically low air speeds, recognition of, and recovery from, incipient and full stalls;

(v) flight at critically high air speeds, recognition of, and recovery from, spiral dive;

(vi) normal and crosswind take-offs and landings;

(vii) maximum performance (short field and obstacle clearance) take-offs, short-field landings;

(viii) flight by reference solely to instruments, including the completion of a level 180 ° turn;

(ix) cross-country flying using visual reference, dead reckoning and radio navigation aids;

(x) emergency operations, including simulated aeroplane equipment malfunctions;

(xi) operations to, from and transiting controlled aerodromes, compliance with air traffic services procedures, communication procedures and phraseology.

(2) Before allowing applicants for a PPL(A) to undertake their first solo flight, the FI should ensure that the applicant can use R/T communication and can operate the required systems and equipment..

(c) Syllabus of flight instruction

(1) The numbering of exercises should be used primarily as an exercise reference list and as a broad instructional sequencing guide; therefore the demonstrations and practices need not necessarily be given in the order listed. The actual order and content will depend upon the following interrelated factors:

(i) the applicant's progress and ability;

(ii) the weather conditions affecting the flight;

(iii) the flight time available;

(iv) instructional technique considerations;

(v) the local operating environment;

(vi) applicability of the exercises to the aeroplane.

(2) Each of the exercises involves the need for the applicant to be aware of the needs of good airmanship and look-out, which should be emphasised at all times.

(i) Exercise 1a: Familiarisation with the aeroplane:

(E) characteristics of the aeroplane;

(F) cockpit layout;

(G) systems;

(H) checklists, drills and controls.

(iii) Exercise 1b: Emergency drills:

(A) action if fire on the ground and in the air;

(B) engine cabin and electrical system fire;

(C) systems failure;

(D) escape drills, location and use of emergency equipment and exits.

(iv) Exercise 2: Preparation for and action after flight:

(A) flight authorisation and aeroplane acceptance;

(B) serviceability documents;

(C) equipment required, maps, etc.;

(D) external checks;

(E) internal checks;

(F) harness, seat or rudder panel adjustments;

(G) starting and warm-up checks;

(H) power checks;

(I) running down system checks and switching off the engine;

(J) parking, security and picketing (for example tie down);

(K) completion of authorisation sheet and serviceability documents.

(v) Exercise 3: Air experience: flight exercise.

(vi) Exercise 4: Effects of controls:

(A) primary effects when laterally level and when banked;

(B) further effects of aileron and rudder;

(C) effects of:

(a) air speed;

(b) slipstream;

(c) power;

(d) trimming controls;

(e) flaps;

(f) other controls, as applicable.

(D) operation of:

(a) mixture control;

(b) carburettor heat;

(c) cabin heating or ventilation.

(vii) Exercise 5a: Taxiing:

(A) pre-taxi checks;

(B) starting, control of speed and stopping;

(C) engine handling;

(D) control of direction and turning;

(E) turning in confined spaces;

(F) parking area procedure and precautions;

(G) effects of wind and use of flying controls;

(H) effects of ground surface;

(I) freedom of rudder movement;

(J) marshalling signals;

(K) instrument checks;

(L) air traffic control procedures.

(viii) Exercise 5b: Emergencies: brake and steering failure.

(ix) Exercise 6: Straight and level:

(A) at normal cruising power, attaining and maintaining straight and level flight;

(B) flight at critically high air speeds;

(C) demonstration of inherent stability;

(D) control in pitch, including use of trim;

(E) lateral level, direction and balance and trim;

(F) at selected air speeds (use of power);

(G) during speed and configuration changes;

(H) use of instruments for precision.

(x) Exercise 7: Climbing:

(A) entry, maintaining the normal and max rate climb and levelling off;

(B) levelling off at selected altitudes;

(C) en-route climb (cruise climb);

(D) climbing with flap down;

(E) recovery to normal climb;

(F) maximum angle of climb;

(G) use of instruments for precision.

(xi) Exercise 8: Descending:

(A) entry, maintaining and levelling off;

(B) levelling off at selected altitudes;

(C) glide, powered and cruise descent (including effect of power and air speed);

(D) side slipping (on suitable types);

(E) use of instruments for precision flight.

(xii) Exercise 9: Turning:

(A) entry and maintaining medium level turns;

(B) resuming straight flight;

(C) faults in the turn (for example in correct pitch, bank and balance);

(D) climbing turns;

(E) descending turns;

(F) faults in the turns (slipping and skidding on suitable types);

(G) turns onto selected headings, use of gyro heading indicator and compass;

(H) use of instruments for precision.

(xiii) Exercise 10a: Slow flight:

Note: the objective is to improve the student's ability to recognise inadvertent flight at critically low speeds and provide practice in maintaining the aeroplane in balance while returning to normal air speed.

(A) safety checks;

(B) introduction to slow flight;

(C) controlled flight down to critically slow air speed;

(D) application of full power with correct attitude and balance to achieve normal climb speed.

(xiv) Exercise 10b: Stalling:

(A) safety checks;

(B) symptoms;

(C) recognition;

(D) clean stall and recovery without power and with power;

(E) recovery when a wing drops;

(F) approach to stall in the approach and in the landing configurations, with and without power and recovery at the incipient stage.

(xv) Exercise 11: Spin avoidance:

(A) safety checks;

(B) stalling and recovery at the incipient spin stage (stall with excessive wing drop, about 45 °);

(C) instructor induced distractions during the stall.

Note 1: at least two hours of stall awareness and spin avoidance flight training should be completed during the course.

Note 2: consideration of manoeuvre limitations and the need to refer to the aeroplane manual and mass and balance calculations.

(xvi) Exercise 12: Take-off and climb to downwind position:

(A) pre-take-off checks;

(B) into wind take-off;

(C) safeguarding the nose wheel;

(D) crosswind take-off;

(E) drills during and after take-off;

(F) short take-off and soft field procedure/techniques including performance calculations;

(G) noise abatement procedures.

(xvii) Exercise 13: Circuit, approach and landing:

(A) circuit procedures, downwind and base leg;

(B) powered approach and landing;

(C) safeguarding the nose wheel;

(D) effect of wind on approach and touchdown speeds and use of flaps;

(E) crosswind approach and landing;

(F) glide approach and landing;

(G) short landing and soft field procedures or techniques;

(H) flapless approach and landing;

(I) wheel landing (tail wheel aeroplanes);

(J) missed approach and go-around;

(K) noise abatement procedures.

(xviii) Exercise 12/13: Emergencies:

(A) abandoned take-off;

(B) engine failure after take-off;

(C) mislanding and go-around;

(D) missed approach.

Note: in the interests of safety it will be necessary for pilots trained on nose wheel aeroplanes to undergo dual conversion training before flying tail wheel aeroplanes, and vice-versa.

(xix) Exercise 14: First solo:

(A) instructor's briefing, observation of flight and de-briefing;

Note: during flights immediately following the solo circuit consolidation the following should be revised:

(B) procedures for leaving and rejoining the circuit;

(C) the local area, restrictions, map reading;

(D) use of radio aids for homing;

(E) turns using magnetic compass, compass errors.

(xx) Exercise 15: Advanced turning:

(A) steep turns (45 °), level and descending;

(B) stalling in the turn and recovery;

(C) recoveries from unusual attitudes, including spiral dives.

(xxi) Exercise 16: Forced landing without power:

(A) forced landing procedure;

(B) choice of landing area, provision for change of plan;

(C) gliding distance;

(D) descent plan;

(E) key positions;

(F) engine cooling;

(G) engine failure checks;

(H) use of radio;

(I) base leg;

(J) final approach;

(K) landing;

(L) actions after landing.

(xxii) Exercise 17: Precautionary landing:

(A) full procedure away from aerodrome to break-off height;

(B) occasions necessitating;

(C) in-flight conditions;

(D) landing area selection:

(a) normal aerodrome;

(b) disused aerodrome;

(c) ordinary field.

(E) circuit and approach;

(F) actions after landing.

(xxiii) Exercise 18a: Navigation:

(A) flight planning:

(a) weather forecast and actuals;

(b) map selection and preparation:

(1) choice of route;

(2) controlled airspace;

(3) danger, prohibited and restricted areas;

(4) safety altitudes.

(c) calculations:

(1) magnetic heading(s) and time(s) en-route;

(2) fuel consumption;

(3) mass and balance;

(4) mass and performance.

(d) flight information:

(1) NOTAMs etc.;

(2) radio frequencies;

(3) selection of alternate aerodromes.

(e) aeroplane documentation;

(f) notification of the flight:

(1) pre-flight administrative procedures;

(2) flight plan form.

(B) departure:

(a) organisation of cockpit workload;

(b) departure procedures:

(1) altimeter settings;

(2) ATC liaison in controlled or regulated airspace;

(3) setting heading procedure;

(4) noting of ETAs.

(c) maintenance of altitude and heading;

(d) revisions of ETA and heading;

(e) log keeping;

(f) use of radio;

(g) use of navaids;

(h) minimum weather conditions for continuation of flight;

(i) in-flight decisions;

(j) transiting controlled or regulated airspace;

(k) diversion procedures;

(l) uncertainty of position procedure;

(m) lost procedure.

(C) arrival and aerodrome joining procedure:

(a) ATC liaison in controlled or regulated airspace;

(b) altimeter setting;

(c) entering the traffic pattern;

(d) circuit procedures;

(e) parking;

(f) security of aeroplane;

(g) refuelling;

(h) closing of flight plan, if appropriate;

(i) post-flight administrative procedures.

(xxiv) Exercise 18b: Navigation problems at lower levels and in reduced visibility:

(A) actions before descending;

(B) hazards (for example obstacles and terrain);

(C) difficulties of map reading;

(D) effects of wind and turbulence;

(E) vertical situational awareness (avoidance of controlled flight into terrain);

(F) avoidance of noise sensitive areas;

(G) joining the circuit;

(H) bad weather circuit and landing.

(xxv) Exercise 18c: Radio navigation:

(A) use of GNSS:

(a) selection of waypoints;

(b) to or from indications and orientation;

(c) error messages.

(B) use of VHF omni range:

(a) availability, AIP and frequencies;

(b) selection and identification;

(c) OBS;

(d) to or from indications and orientation;

(e) CDI;

(f) determination of radial;

(g) intercepting and maintaining a radial;

(h) VOR passage;

(i) obtaining a fix from two VORs.

(C) use of ADF equipment: NDBs:

(a) availability, AIP and frequencies;

(b) selection and identification;

(c) orientation relative to the beacon;

(d) homing.

(D) use of VHF/DF:

(a) availability, AIP, frequencies;

(b) R/T procedures and ATC liaison;

(c) obtaining a QDM and homing.

(E) use of en-route or terminal radar:

(a) availability and AIP;

(b) procedures and ATC liaison;

(c) pilot's responsibilities;

(d) secondary surveillance radar:

(1) transponders;

(2) code selection;

(3) interrogation and reply.

(F) use of DME:

(a) station selection and identification;

(b) modes of operation: distance, groundspeed and time to run.

(xxvi) Exercise 19: Basic instrument flight:

(A) physiological sensations;

(B) instrument appreciation; attitude instrument flight;

(C) instrument limitations;

(D) basic manoeuvres:

(a) straight and level at various air speeds and configurations;

(b) climbing and descending;

(c) standard rate turns, climbing and descending, onto selected headings;

(d) recoveries from climbing and descending turns.

(d) BITD

(1) A BITD may be used for flight training for:

(i) flight by reference solely to instruments;

(ii) navigation using radio navigation aids;

(iii) basic instrument flight.

(13) The use of the BITD should be subject to the following:

(i) the training should be complemented by exercises on an aeroplane;

(ii) the record of the parameters of the flight must be available;

(iii) A FI(A) or STI(A) should conduct the instruction.

AMC1 FCL.210.PPL(H) - Training course

FLIGHT INSTRUCTION FOR THE PPL(H)

(a) Entry to training

Before being accepted for training an applicant should be informed that the appropriate medical certificate must be obtained before solo flying is permitted.

(b) Ground instruction

Enhanced ground instruction in weather interpretation, planning and route assessment, decision making on encountering DVE including reversing course or conducting a precautionary landing.

(c) Flight instruction

(1) The PPL(H) flight instruction syllabus should take into account the principles of threat and error management and cover:

(i) pre-flight operations, including mass and balance determination, helicopter inspection and servicing;

(ii) aerodrome and traffic pattern operations, collision avoidance precautions and procedures;

(iii) control of the helicopter by external visual reference;

(iv) take-offs, landings, hovering, look-out turns and normal transitions from and to the hover;

(v) emergency procedures, basic autorotations, simulated engine failure, ground resonance recovery if relevant to type;

(vi) sideways and backwards flight, turns on the spot;

(vii) incipient vortex ring recognition and recovery;

(viii) touchdown autorotations, simulated engine-off landings, practice forced landings. Simulated equipment malfunctions and emergency procedures relating to malfunctions of engines, controls, electrical and hydraulic circuits;

(ix) steep turns;

(x) transitions, quick stops, out of wind manoeuvres, sloping ground landings and take-offs;

(xi) limited power and confined area operations, including selection of and operations to and from unprepared sites;

(xii) flight by sole reference to basic flight instruments, including completion of a level 180 ° turn and recovery from unusual attitudes to simulate inadvertent entry into cloud (this training may be conducted by an FI(H));

(xiii) cross-country flying by using visual reference, DR, GNNS and, where available, radio navigation aids; simulation of deteriorating weather conditions and actions to divert or conduct precautionary landing;

(xiv) operations to, from and transiting controlled aerodromes; compliance with air traffic services procedures, communication procedures and phraseology.

(2) Before allowing applicants for a PPL(H) to undertake their first solo flight, the FI should ensure that the applicant can use R/T communication and can operate the required systems and equipment.

(14) Wherever possible, flight simulation should be used to demonstrate to student pilots the effects of flight into DVE and to enhance their understanding and need for avoidance of this potentially fatal flight regime.

(d) Syllabus of flight instruction

(1) The numbering of exercises should be used primarily as an exercise reference list and as a broad instructional sequencing guide; therefore the demonstrations and practices need not necessarily be given in the order listed. The actual order and content will depend upon the following interrelated factors:

(i) the applicant's progress and ability;

(ii) the weather conditions affecting the flight;

(iii) the flight time available;

(iv) instructional technique considerations;

(v) the local operating environment;

(vi) applicability of the exercises to the helicopter.

(2) Each of the exercises involves the need for the applicant to be aware of the needs of good airmanship and look-out, which should be emphasised at all times.

(i) Exercise 1a: Familiarisation with the helicopter:

(A) characteristics of the helicopter, external features;

(B) cockpit layout;

(C) systems;

(D) checklists, procedures and controls.

(ii) Exercise 1b: Emergency procedures:

(A) action if fire on the ground and in the air;

(B) engine, cabin and electrical system fire;

(C) systems failures;

(D) escape drills, location and use of emergency equipment and exits.

(iii) Exercise 2: Preparation for and action after flight:

(A) flight authorisation and helicopter acceptance;

(B) serviceability documents;

(C) equipment required, maps, etc.;

(D) external checks;

(E) internal checks;

(F) seat, harness and flight controls adjustments;

(G) starting and warm-up checks clutch engagement and starting rotors;

(H) power checks;

(I) running down system checks and switching off the engine;

(J) parking, security and picketing;

(K) completion of authorisation sheet and serviceability documents.

(iv) Exercise 3: Air experience:

(A) to introduce the student to rotary wing flight;

(B) flight exercise.

(v) Exercise 4: Effects of controls:

(A) function of flight controls, primary and secondary effect;

(B) effects of:

(a) air speed;

(b) power changes (torque);

(c) yaw (sideslip);

(d) disc loading (bank and flare);

(e) controls of selecting hydraulics on/off;

(f) control friction.

(C) instruments;

(D) use of carburettor heat or anti-icing control.

(vi) Exercise 5: Power and attitude changes:

(A) relationship between cyclic control position, disc attitude, fuselage attitude and air speed;

(B) flapback;

(C) power required diagram in relation to air speed;

(D) power and air speed changes in level flight;

(E) use of instruments for precision;

(F) engine and air speed limitations.

(vii) Exercise 6: Straight and level:

(A) at normal cruising power, attaining and maintaining straight and level flight;

(B) control in pitch, including use of control friction or trim;

(C) maintaining direction and balance, (ball or yawstring use);

(D) setting power for selected air speeds and speed changes;

(E) use of instruments for precision.

(viii) Exercise 7: Climbing:

(A) optimum climb speed, best angle or rate of climb from power required diagram;

(B) initiation, maintaining the normal and maximum rate of climb, levelling off;

(C) levelling off at selected altitudes or heights;

(D) use of instruments for precision.

(ix) Exercise 8: Descending:

(A) optimum descent speed, best angle or rate of descent from power required diagram;

(B) initiation, maintaining and levelling off;

(C) levelling off at selected altitudes or heights;

(D) descent (including effect of power and air speed);

(E) use of instruments for precision.

(x) Exercise 9: Turning:

(A) initiation and maintaining medium level turns;

(B) resuming straight flight;

(C) altitude, bank and co-ordination;

(D) climbing and descending turns and effect on rate of climb or descent;

(E) turns onto selected headings, use of gyro heading indicator and compass;

(F) use of instruments for precision.

(xi) Exercise 10: Basic autorotation:

(A) safety checks, verbal warning and look-out;

(B) entry, development and characteristics;

(C) control of air speed and RRPM, rotor and engine limitations;

(D) effect of AUM, IAS, disc loading, G forces and density altitude;

(E) re-engagement and go-around procedures (throttle over-ride or ERPM control);

(F) vortex condition during recovery;

(G) gentle and medium turns in autorotation;

(H) demonstration of variable flare simulated engine off landing.

(xii) Exercise 11a: Hovering:

(A) demonstrate hover IGE, importance of wind effect and attitude, ground cushion, stability in the hover and effects of over controlling;

(B) student holding cyclic stick only;

(C) student handling collective lever (and throttle) only;

(D) student handling collective lever, (throttle) and pedals;

(E) student handling all controls;

(F) demonstration of ground effect;

(G) demonstration of wind effect;

(H) demonstrate gentle forward running touchdown;

(I) specific hazards for example snow, dust and litter.

(xiii) Exercise 11b: Hover taxiing and spot turns:

(A) revise hovering;

(B) precise ground speed and height control;

(C) effect of wind direction on helicopter attitude and control margin;

(D) control and co-ordination during spot turns;

(E) carefully introduce gentle forward running touchdown.

(xiv) Exercise 11c: Hovering and taxiing emergencies:

(A) revise hovering and gentle forward running touchdown, explain (demonstrate where applicable) effect of hydraulics failure in the hover;

(B) demonstrate simulated engine failure in the hover and hover taxi;

(C) demonstrate dangers of mishandling and over-pitching.

(xv) Exercise 12: Take-off and landing:

(A) pre-take-off checks or drills;

(B) look-out;

(C) lifting to hover;

(D) after take-off checks;

(E) danger of horizontal movement near ground;

(F) danger of mishandling and overpitching;

(G) landing (without sideways or backwards movement);

(H) after landing checks or drills;

(I) take-off and landing crosswind and downwind.

(xvi) Exercise 13: Transitions from hover to climb and approach to hover:

(A) look-out;

(B) revise take-off and landing;

(C) ground effect, translational lift and its effects;

(D) flapback and its effects;

(E) effect of wind speed and direction during transitions from or to the hover;

(F) the constant angle approach;

(G) demonstration of variable flare simulated engine off landing.

(xvii) Exercise 14a: Circuit, approach and landing:

(A) revise transitions from hover to climb and approach to hover;

(B) circuit procedures, downwind and base leg;

(C) approach and landing with power;

(D) pre-landing checks;

(E) effect of wind on approach and IGE hover;

(F) crosswind approach and landing;

(G) go-around;

(H) noise abatement procedures.

(xviii) Exercise 14b: Steep and limited power approaches and landings:

(A) revise the constant angle approach;

(B) the steep approach (explain danger of high sink rate and low air speed)

(C) limited power approach (explain danger of high speed at touch down);

(D) use of the ground effect;

(E) variable flare simulated engine off landing.

(xix) Exercise 14c: Emergency procedures:

(A) abandoned take-off;

(B) missed approach and go-around;

(C) hydraulic off landing (if applicable);

(D) tail rotor control or tail rotor drive failure (briefing only)

(E) simulated emergencies in the circuit to include:

(a) hydraulics failure;

(b) simulated engine failure on take-off, crosswind, downwind and base leg;

(c) governor failure.

(xx) Exercise 15: First solo:

(A) instructor's briefing, observation of flight and debriefing;

(B) warn of change of attitude from reduced and laterally displaced weight;

(C) warn of low tail, low skid or wheel during hover, landing;

(D) warn of dangers of loss of RRPM and overpitching;

(E) pre-take-off checks;

(F) into wind take-off;

(G) procedures during and after take-off;

(H) normal circuit, approaches and landings;

(I) action if an emergency.

(xxi) Exercise 16: Sideways and backwards hover manoeuvring:

(A) manoeuvring sideways flight heading into wind;

(B) manoeuvring backwards flight heading into wind;

(C) combination of sideways and backwards manoeuvring;

(D) manoeuvring sideways and backwards and heading out of wind;

(E) stability and weather cocking;

(F) recovery from backwards manoeuvring (pitch nose down);

(G) limitations for sideways and backwards manoeuvring.

(xxii) Exercise 17: Spot turns:

(A) revise hovering into wind and downwind;

(B) turn on spot through 360º:

(a) around pilots position;

(b) around tail rotor;

(c) around helicopter geometric centre;

(d) square and safe visibility clearing turn.

(C) rotor RPM control, torque effect, cyclic limiting stops due to CG position and wind speed and direction.

(xxiii) Exercise 18: Hover OGE and vortex ring:

(A) establishing hover OGE;

(B) drift, height or power control;

(C) demonstration of incipient stage of vortex ring, recognition and recovery (from a safe altitude);

(D) loss of tail rotor effectiveness.

(xxiv) Exercise 19: Simulated EOL:

(A) the effect of weight, disc loading, density attitude and RRPM decay;

(B) revise basic autorotation entry;

(C) optimum use of cyclic and collective to control speed or RRPM;

(D) variable flare simulated EOL;

(E) demonstrate constant attitude simulated EOL;

(F) demonstrate simulated EOL from hover or hover taxi;

(G) demonstrate simulated EOL from transition and low level.

(xxv) Exercise 20: Advanced autorotation:

(A) over a selected point at various height and speed;

(B) revise basic autorotation: note ground distance covered;

(C) range autorotation;

(D) low speed autorotation;

(E) constant attitude autorotation (terminate at safe altitude);

(F) 'S' turns;

(G) turns through 180 ° and 360 °;

(H) effects on angles of descent, IAS, RRPM and effect of AUM.

(xxvi) Exercise 21: Practice forced landings:

(A) procedure and choice of the forced landing area;

(B) forced landing checks and crash action;

(C) re-engagement and go-around procedures.

(xxvii) Exercise 22: Steep turns:

(A) steep (level) turns (30 ° bank);

(B) maximum rate turns (45 ° bank if possible);

(C) steep autorotative turns;

(D) faults in the turn: balance, attitude, bank and co-ordination;

(E) RRPM control and disc loading;

(F) vibration and control feedback;

(G) effect of wind at low level.

(xxviii) Exercise 23: Transitions:

(A) revise ground effect, translational lift and flapback;

(B) maintaining constant height, (20-30 ft AGL);

(C) transition from hover to minimum 50 knots IAS and back to hover;

(D) demonstrate effect of wind.

(xxix) Exercise 24: Quick stops:

(A) use of power and controls;

(B) effect of wind;

(C) quick stops into wind;

(D) quick stops from crosswind and downwind terminating into wind;

(E) danger of vortex ring;

(F) danger of high disc loading.

(xxx) Exercise 25a: Navigation:

(A) flight planning:

(a) weather forecast and actuals;

(b) map selection and preparation and use;

(1) choice of route:

(2) controlled airspace, danger and prohibited areas;

(3) safety altitudes and noise abatement considerations.

(c) calculations:

(1) magnetic heading(s) and time(s) en-route;

(2) fuel consumption;

(3) mass and balance.

(d) flight information:

(1) NOTAMs, etc.;

(2) radio frequencies;

(3) selection of alternate landing sites.

(e) helicopter documentation;

(f) notification of the flight:

(1) pre-flight administrative procedures;

(2) flight plan form (where appropriate).

(B) departure:

(a) organisation of cockpit workload;

(b) departure procedures:

(1) altimeter settings;

(2) ATC liaison in controlled or regulated airspace;

(3) setting heading procedure;

(4) noting of ETAs.

(c) maintenance of height or altitude and heading;

(d) revisions of ETA and heading:

(1) 10 ° line, double track and track error and closing angle;

(2) 1 in 60 rule;

(3) amending an ETA.

(e) log keeping;

(f) use of radio;

(g) use of navaids (if fitted);

(h) minimum weather conditions for continuation of flight;

(i) in-flight decisions;

(j) transiting controlled or regulated airspace;

(k) uncertainty of position procedure;

(l) lost procedure.

(C) arrival and aerodrome joining procedure:

(a) ATC liaison in controlled or regulated airspace;

(b) altimeter setting;

(c) entering the traffic pattern;

(d) circuit procedures.

(e) parking;

(f) security of helicopter;

(g) refuelling;

(h) closing of flight plan (if appropriate);

(i) post-flight administrative procedures.

(xxxi) Exercise 25b: Navigation problems at low heights and in reduced visibility:

(A) actions before descending;

(B) hazards (for example obstacles and other aircraft);

(C) difficulties of map reading;

(D) effects of wind and turbulence;

(E) avoidance of noise sensitive areas;

(F) actions in the event of encountering DVE;

(G) decision to divert or conduct precautionary landing;

(H) bad weather circuit and landing;

(I) appropriate procedures and choice of landing area;

(J) precautionary landing.

(xxxii) Exercise 25c: Radio navigation:

(A) use of GNSS:

(a) selection of waypoints;

(b) to or from indications and orientation;

(c) error messages;

(d) hazards of over-reliance on the use of GNSS in the continuation of flight in DVE.

(B) use of VHF omni range:

(a) availability, AIP and frequencies;

(b) selection and identification;

(c) OBS;

(d) to or from indications and orientation;

(e) CDI;

(f) determination of radial;

(g) intercepting and maintaining a radial;

(h) VOR passage;

(i) obtaining a fix from two VORs.

(C) use of ADF equipment: NDBs:

(a) availability, AIP and frequencies;

(b) selection and identification;

(c) orientation relative to the beacon;

(d) homing.

(D) use of VHF/DF:

(a) availability, AIP and frequencies;

(b) RTF procedures and ATC liaison;

(c) obtaining a QDM and homing.

(E) use of en-route or terminal radar:

(a) availability and AIP;

(b) procedures and ATC liaison;

(c) pilots responsibilities;

(d) secondary surveillance radar (if transponder fitted):

(1) transponders;

(2) code selection;

(3) interrogation and reply.

(F) use of DME:

(a) station selection and identification;

(b) modes of operation: distance, groundspeed and time to run.

(xxxiii) Exercise 26: Advanced take-off, landings and transitions:

(A) landing and take-off out of wind (performance reduction);

(B) ground effect, translational lift and directional stability variation when out of wind;

(C) downwind transitions;

(D) vertical take-off over obstacles;

(E) running take-off;

(F) cushion creep take-off;

(G) reconnaissance of landing site;

(H) running landing;

(I) zero speed landing;

(J) crosswind and downwind landings;

(K) steep approach;

(L) go-around.

(xxxiv) Exercise 27: Sloping ground:

(A) limitations and assessing slope angle;

(B) wind and slope relationship: blade and control stops;

(C) effect of CG when on slope;

(D) ground effect on slope and power required;

(E) right skid up slope;

(F) left skid up slope;

(G) nose up slope;

(H) avoidance of dynamic roll over, dangers of soft ground and sideways movement on touchdown;

(I) danger of striking main or tail rotor by harsh control movement near ground.

(xxxv) Exercise 28: Limited power:

(A) take-off power check;

(B) vertical take-off over obstacles;

(C) in-flight power check;

(D) running landing;

(E) zero speed landing;

(F) approach to low hover;

(G) approach to hover;

(H) approach to hover OGE;

(I) steep approach;

(J) go-around.

(xxxvi) Exercise 29: Confined areas:

(A) landing capability and performance assessment;

(B) locating landing site and assessing wind speed and direction;

(C) reconnaissance of landing site;

(D) select markers;

(E) select direction and type of approach;

(F) circuit;

(G) approach to committed point and go-around;

(H) approach;

(I) clearing turn;

(J) landing;

(K) power check and performance assessment in and out of ground effect;

(L) normal take-off to best angle of climb speed;

(M) vertical take-off from hover.

(xxxvii) Exercise 30: Basic instrument flight:

(A) physiological sensations;

(B) instrument appreciation:

(a) attitude instrument flight;

(b) instrument scan.

(C) instrument limitations;

(D) basic manoeuvres:

(a) straight and level at various air speeds and configurations;

(b) climbing and descending;

(c) standard rate turns, climbing and descending, onto selected headings.

(E) recoveries from climbing and descending turns;

(F) recoveries from unusual attitudes.

AMC1 FCL.210(c) - Training course

CHANGE OF TRAINING ORGANISATION

In cases where the applicant completes the training course (theoretical knowledge instruction or flight instruction) at a different ATO ('completing training organisation') from the one where they have started the training course ('starting training organisation'), the applicant should request from the starting training organisation a copy of the records kept in accordance with point ORA.ATO.120.'

AMC1 FCL.210; FCL.215 - Training course and theoretical knowledge examination

SYLLABUS OF THEORETICAL KNOWLEDGE FOR THE PPL(A) AND PPL(H)

The following tables contain the syllabi for the courses of theoretical knowledge, as well as for the theoretical knowledge examinations for the PPL(A) and PPL(H). The training and examination should cover aspects related to non-technical skills in an integrated manner, taking into account the particular risks associated to the licence and the activity.

The ATO responsible for the training should check if all the appropriate elements of the training course of theoretical knowledge instruction have been completed to a satisfactory standard before recommending the applicant for the examination.

The applicable items for each licence are marked with 'x'. An 'x' on the main title of a subject means that all the sub-divisions are applicable.

		Aeroplane		Helicopter	
		PPL	Bridge course	PPL	Bridge course
1.	**AIR LAW AND ATC PROCEDURES**				
	International law: conventions, agreements and organisations				
	The Convention on international civil aviation (Chicago) Doc. 7300/6				
	Part I Air Navigation: relevant parts of the following chapters: (a) general principles and application of the convention; (b) flight over territory of Contracting States; (c) nationality of aircraft; (d) measures to facilitate air navigation; (e) conditions to be fulfilled on aircraft; (f) international standards and recommended practices; (g) validity of endorsed certificates and licences; (h) notification of differences.	x		x	
	Part II The International Civil Aviation Organisation (ICAO): objectives and composition	x		x	
	Annex 8: Airworthiness of aircraft				
	Foreword and definitions	x		x	
	Certificate of airworthiness	x		x	
	Annex 7: Aircraft nationality and registration marks				
	Foreword and definitions	x		x	
	Common- and registration marks	x		x	
	Certificate of registration and aircraft nationality	x		x	
	Annex 1: Personnel licensing				
	Definitions	x		x	
	Relevant parts of Annex 1 connected to TCAR PEL Part ORA, Part FCL and Medical regulations	x		x	
	Annex 2: Rules of the air				
	Essential definitions, applicability of the rules of the air, general rules (except water operations), visual flight rules, signals and interception of civil aircraft	x		x	
	Procedures for air navigation: aircraft operations doc. 8168-ops/611, volume 1				
	Altimeter setting procedures (including IACO doc. 7030 – regional supplementary procedures)				
	Basic requirements (except tables), procedures applicable to operators and pilots (except tables)	x		x	
	Secondary surveillance radar transponder operating procedures (including ICAO Doc. 7030 – regional supplementary procedures)				
	Operation of transponders	x		x	
	Phraseology	x		x	
	Annex 11: Doc. 4444 air traffic management				
	Definitions	x		x	

		Aeroplane		Helicopter	
		PPL	Bridge course	PPL	Bridge course
	General provisions for air traffic services	x		x	
	Visual separation in the vicinity of aerodromes	x		x	
	Procedures for aerodrome control services	x		x	
	Radar services	x		x	
	Flight information service and alerting service	x		x	
	Phraseologies	x		x	
	Procedures related to emergencies, communication failure and contingencies	x		x	
	Annex 15: Aeronautical information service				
	Introduction, essential definitions	x		x	
	AIP, NOTAM, AIRAC and AIC	x		x	
	Annex 14, volume 1 and 2: Aerodromes				
	Definitions	x		x	
	Aerodrome data: conditions of the movement area and related facilities	x		x	
	Visual aids for navigation: (a) indicators and signalling devices; (b) markings; (c) lights; (d) signs; (e) markers.	x		x	
	Visual aids for denoting obstacles: (a) marking of objects; (b) lighting of objects.	x		x	
	Visual aids for denoting restricted use of areas	x		x	
	Emergency and other services: (a) rescue and fire fighting; (b) apron management service.	x		x	
	Annex 12: Search and rescue				
	Essential definitions	x		x	
	Operating procedures: (a) procedures for PIC at the scene of an accident; (b) procedures for PIC intercepting a distress transmission; (c) search and rescue signals.	x		x	
	Search and rescue signals:	x		x	
	(a) signals with surface craft; (b) ground or air visual signal code; (c) air or ground signals.				
	Annex 17: Security				
	General: aims and objectives	x		x	
	Annex 13: Aircraft accident investigation				
	Essential definitions	x		x	

		Aeroplane		Helicopter	
		PPL	Bridge course	PPL	Bridge course
	Applicability	x		x	
	National law				
	National law and differences to relevant ICAO Annexes.	x		x	
2.	**HUMAN PERFORMANCE**				
	Human factors: basic concepts				
	Human factors in aviation				
	Becoming a competent pilot	x		x	
	Basic aviation physiology and health maintenance				
	The atmosphere: (a) composition; (b) gas laws.	x		x	
	Respiratory and circulatory systems: (a) oxygen requirement of tissues; (b) functional anatomy; (c) main forms of hypoxia (hypoxic and anaemic): (1) sources, effects and counter-measures of carbon monoxide; (2) counter measures and hypoxia; (3) symptoms of hypoxia. (d) hyperventilation; (e) the effects of accelerations on the circulatory system; (f) hypertension and coronary heart disease.	x		x	
	Man and environment				
	Central, peripheral and autonomic nervous systems	x		x	
	Vision: (a) functional anatomy; (b) visual field, foveal and peripheral vision; (c) binocular and monocular vision; (d) monocular vision cues; (e) night vision; (f) visual scanning and detection techniques and importance of 'look-out'; (g) defective vision.	x		x	
	Hearing: (a) descriptive and functional anatomy; (b) flight related hazards to hearing; (c) hearing loss.	x		x	
	Equilibrium: (a) functional anatomy; (b) motion and acceleration; (c) motion sickness.	x		x	
	Integration of sensory inputs: (a) spatial disorientation: forms, recognition and avoidance;	x		x	

		Aeroplane		Helicopter	
		PPL	Bridge course	PPL	Bridge course
	(b) illusions: forms, recognition and avoidance: (1) physical origin; (2) physiological origin; (3) psychological origin. (c) approach and landing problems.				
	Health and hygiene				
	Personal hygiene: personal fitness	x		x	
	Body rhythm and sleep: (a) rhythm disturbances; (c) symptoms, effects and management.	x		x	
	Problem areas for pilots: (a) common minor ailments including cold, influenza and gastro-intestinal upset; (b) entrapped gases and barotrauma, (scuba diving); (c) obesity; (d) food hygiene; (e) infectious diseases; (f) nutrition; (g) various toxic gases and materials.	x		x	
	Intoxication: (a) prescribed medication; (b) tobacco; (c) alcohol and drugs; (d) caffeine; (e) self-medication.	x		x	
	Basic aviation psychology				
	Human information processing				
	Attention and vigilance: (a) selectivity of attention; (b) divided attention.	x		x	
	Perception: (A) perceptual illusions; (B) subjectivity of perception; (C) processes of perception.	x		x	
	Memory: (a) sensory memory; (b) working or short term memory; (c) long term memory to include motor memory (skills).	x		x	
	Human error and reliability				

		Aeroplane		Helicopter	
		PPL	Bridge course	PPL	Bridge course
	Reliability of human behaviour	x		x	
	Error generation: social environment (group, organisation)	x		x	
	Decision making				
	Decision-making concepts: (a) structure (phases); (b) limits; (c) risk assessment; (d) practical application.	x		x	
	Avoiding and managing errors: cockpit management				
	Safety awareness: (a) risk area awareness; (b) situational awareness.	x		x	
	Communication: verbal and non-verbal communication	x		x	
	Human behaviour				
	Personality and attitudes: (a) development; (b) environmental influences.	x		x	
	Identification of hazardous attitudes (error proneness)	x		x	
	Human overload and underload				
	Arousal	x		x	
	Stress: (a) definition(s); (b) anxiety and stress; (c) effects of stress.	x		x	
	Fatigue and stress management: (a) types, causes, and symptoms of fatigue; (b) effects of fatigue; (c) coping strategies; (d) management techniques; (e) health and fitness programmes.	x		x	
3.	**METEOROLOGY**				
	The atmosphere				
	Composition, extent and vertical division				
	Structure of the atmosphere	x		x	
	Troposphere	x		x	
	Air temperature				
	Definition and units	x		x	
	Vertical distribution of temperature	x		x	
	Transfer of heat	x		x	
	Lapse rates, stability and instability	x		x	
	Development of inversions and types of inversions	x		x	
	Temperature near the earth's surface, surface effects, diurnal and seasonal variation, effect of clouds and effect of wind	x		x	

		Aeroplane		Helicopter	
		PPL	Bridge course	PPL	Bridge course
	Atmospheric pressure				
	Barometric pressure and isobars	x		x	
	Pressure variation with height	x		x	
	Reduction of pressure to mean sea level	x		x	
	Relationship between surface pressure centres and pressure centres aloft	x		x	
	Air density				
	Relationship between pressure, temperature and density	x		x	
	ISA				
	ICAO standard atmosphere	**x**		**x**	
	Altimetry				
	Terminology and definitions	x		x	
	Altimeter and altimeter settings	x		x	
	Calculations	x		x	
	Effect of accelerated airflow due to topography	x		x	
	Wind				
	Definition and measurement of wind				
	Definition and measurement	x		x	
	Primary cause of wind				
	Primary cause of wind, pressure gradient, coriolis force and gradient wind	x		x	
	Variation of wind in the friction layer	x		x	
	Effects of convergence and divergence	x		x	
	General global circulation				
	General circulation around the globe	x		x	
	Local winds				
	Anabatic and katabatic winds, mountain and valley winds, Venturi effects, land and sea breezes	x		x	
	Mountain waves (standing waves, lee waves)				
	Origin and characteristics	x		x	
	Turbulence				
	Description and types of turbulence	x		x	
	Formation and location of turbulence	x		x	
	THERMODYNAMICS				
	Humidity				
	Water vapour in the atmosphere	x		x	
	Mixing ratio	x		x	
	Temperature/dew point, relative humidity	x		x	
	Change of state of aggregation				
	Condensation, evaporation, sublimation, freezing and melting, latent heat	x		x	
	Adiabatic processes				
	Adiabatic processes, stability of the atmosphere	x		x	
	CLOUDS AND FOG				
	Cloud formation and description				

		Aeroplane		Helicopter	
		PPL	Bridge course	PPL	Bridge course
	Cooling by adiabatic expansion and by advection	x		x	
	Cloud types and cloud classification	x		x	
	Influence of inversions on cloud development	x		x	
	Fog, mist, haze				
	General aspects	x		x	
	Radiation fog	x		x	
	Advection fog	x		x	
	Steaming fog	x		x	
	Frontal fog	x		x	
	Orographic fog (hill fog)	x		x	
	PRECIPITATION				
	Development of precipitation				
	Processes of development of precipitation	x		x	
	Types of precipitation				
	Types of precipitation, relationship with cloud types	x		x	
	AIR MASSES AND FRONTS				
	Air masses				
	Description, classification and source regions of air masses	x		x	
	Modifications of air masses	x		x	
	Fronts				
	General aspects	x		x	
	Warm front, associated clouds, and weather	x		x	
	Cold front, associated clouds, and weather	x		x	
	Warm sector, associated clouds, and weather	x		x	
	Weather behind the cold front	x		x	
	Occlusions, associated clouds, and weather	x		x	
	Stationary front, associated clouds, and weather	x		x	
	Movement of fronts and pressure systems, life cycle	x		x	
	Changes of meteorological elements at a frontal wave	x		x	
	PRESSURE SYSTEMS				
	Anticyclone				
	Anticyclones, types, general properties, cold and warm anticyclones, ridges and wedges, subsidence	x		x	
	Non-frontal depressions				
	Thermal, orographic and polar depressions, troughs	x		x	
	CLIMATOLOGY				
	Climatic zones				
	General seasonal circulation in the troposphere	x		x	
	Typical weather situations in the mid-latitudes				
	Westerly situation	x		x	
	High-pressure area	x		x	
	Flat-pressure pattern	x		x	
	Local winds and associated weather				
	e.g. Foehn	x		x	
	FLIGHT HAZARDS				

		Aeroplane		Helicopter	
		PPL	Bridge course	PPL	Bridge course
	Icing				
	Conditions for ice accretion	x		x	
	Types of ice accretion	x		x	
	Hazards of ice accretion, avoidance	x		x	
	Turbulence				
	Effects on flight, avoidance	x		x	
	Wind shear				
	Definition of wind shear	x		x	
	Weather conditions for wind shear	x		x	
	Effects on flight, avoidance	x		x	
	Thunderstorms				
	Conditions for, and process of, development, forecast, location, type specification	x		x	
	Structure of thunderstorms, life cycle, squall lines, electricity in the atmosphere, static charges	x		x	
	Electrical discharges	x		x	
	Development and effects of downbursts	x		x	
	Thunderstorm avoidance	x		x	
	Inversions				
	Influence on aircraft performance	x		x	
	Hazards in mountainous areas				
	Influence of terrain on clouds and precipitation, frontal passage	x		x	
	Vertical movements, mountain waves, wind shear, turbulence, ice accretion	x		x	
	Development and effect of valley inversions	x		x	
	Visibility-reducing phenomena				
	Reduction of visibility caused by precipitation and obscuration	x		x	
	Reduction of visibility caused by other phenomena	x		x	
	METEOROLOGICAL INFORMATION				
	Observation				
	Surface observations	x		x	
	Radiosonde observations	x		x	
	Satellite observations	x		x	
	Weather radar observations	x		x	
	Aircraft observations and reporting	x		x	
	Weather charts				
	Significant weather charts	x		x	
	Surface charts	x		x	
	Information for flight planning				
	Aviation weather messages	x		x	
	Meteorological broadcasts for aviation	x		x	
	Use of meteorological documents	x		x	
	Meteorological warnings	x		x	
	Meteorological services				
	World area forecast system (WAFS) and meteorological offices	x		x	

		Aeroplane		Helicopter	
		PPL	Bridge course	PPL	Bridge course
4.	**COMMUNICATIONS**				
	VFR COMMUNICATIONS				
	Definitions				
	Meanings and significance of associated terms	x		x	
	ATS abbreviations	x		x	
	Q-code groups commonly used in RTF air-ground communications	x		x	
	Categories of messages	x		x	
	General operating procedures				
	Transmission of letters	x		x	
	Transmission of numbers (including level information)	x		x	
	Transmission of time	x		x	
	Transmission technique	x		x	
	Standard words and phrases (relevant RTF phraseology included)	x		x	
	R/T call signs for aeronautical stations including use of abbreviated call signs	x		x	
	R/T call signs for aircraft including use of abbreviated call signs	x		x	
	Transfer of communication	x		x	
	Test procedures including readability scale	x		x	
	Read back and acknowledgement requirements	x		x	
	Relevant weather information terms (VFR)				
	Aerodrome weather	x		x	
	Weather broadcast	x		x	
	Action required to be taken in case of communication failure	x		x	
	Distress and urgency procedures				
	Distress (definition, frequencies, watch of distress frequencies, distress signal and distress message)	x		x	
	Urgency (definition, frequencies, urgency signal and urgency message)	x		x	
	General principles of VHF propagation and allocation of frequencies	x		x	
5.	**PRINCIPLES OF FLIGHT**				
5.1	**PRINCIPLES OF FLIGHT: AEROPLANE**				
	Subsonic aerodynamics				
	Basics concepts, laws and definitions				
	Laws and definitions: (a) conversion of units; (b) Newton´s laws; (c) Bernoulli's equation and venture; (d) static pressure, dynamic pressure and total pressure; (e) density; (f) IAS and TAS.	x	x		
	Basics about airflow: (a) streamline; (b) two-dimensional airflow; (c) three-dimensional airflow.	x	x		

		Aeroplane		Helicopter	
		PPL	Bridge course	PPL	Bridge course
	Aerodynamic forces on surfaces: (a) resulting airforce; (b) lift; (c) drag; (d) angle of attack.	x	x		
	Shape of an aerofoil section: (a) thickness to chord ratio; (b) chord line; (c) camber line; (d) camber; (e) angle of attack.	x	x		
	The wing shape: (a) aspect ratio; (b) root chord; (c) tip chord; (d) tapered wings; (e) wing planform.	x	x		
	The two-dimensional airflow about an aerofoil				
	Streamline pattern	x	x		
	Stagnation point	x	x		
	Pressure distribution	x	x		
	Centre of pressure	x	x		
	Influence of angle of attack	x	x		
	Flow separation at high angles of attack	x	x		
	The lift – α graph	x	x		
	The coefficients				
	The lift coefficient Cl: the lift formula	x	x		
	The drag coefficient Cd: the drag formula	x	x		
	The three-dimensional airflow round a wing and a fuselage				
	Streamline pattern: (a) span-wise flow and causes; (b) tip vortices and angle of attack; (c) upwash and downwash due to tip vortices; (d) wake turbulence behind an aeroplane (causes, distribution and duration of the phenomenon).	x	x		
	Induced drag: (a) influence of tip vortices on the angle of attack; (b) the induced local α; (c) influence of induced angle of attack on the direction of the lift vector; (d) induced drag and angle of attack.	x	x		
	Drag				

		Aeroplane		Helicopter	
		PPL	Bridge course	PPL	Bridge course
	The parasite drag: (a) pressure drag; (b) interference drag; (c) friction drag.	x	x		
	The parasite drag and speed	x	x		
	The induced drag and speed	x	x		
	The total drag	x	x		
	The ground effect				
	Effect on take off and landing characteristics of an aeroplane	x	x		
	The stall				
	Flow separation at increasing angles of attack: (a) the boundary layer: (1) laminar layer; (2) turbulent layer; (3) transition. (b) separation point; (c) influence of angle of attack; (d) influence on: (1) pressure distribution; (2) location of centre of pressure; (3) CL; (4) CD; (5) pitch moments. (e) buffet; (f) use of controls.	x	x		
	The stall speed: (a) in the lift formula; (b) 1g stall speed; (c) influence of: (1) the centre of gravity; (2) power setting; (3) altitude (IAS); (4) wing loading; (5) load factor n: (i) definition; (ii) turns; (iii) forces.	x	x		
	The initial stall in span-wise direction: (a) influence of planform; (b) geometric twist (wash out); (c) use of ailerons.	x	x		
	Stall warning:	x	x		

		Aeroplane		Helicopter	
		PPL	Bridge course	PPL	Bridge course
	(a) importance of stall warning; (b) speed margin; (c) buffet; (d) stall strip; (e) flapper switch; (f) recovery from stall.				
	Special phenomena of stall: (a) the power-on stall; (b) climbing and descending turns; (c) t-tailed aeroplane; (d) avoidance of spins: (1) spin development; (2) spin recognition; (3) spin recovery. (e) ice (in stagnation point and on surface): (1) absence of stall warning; (2) abnormal behaviour of the aircraft during stall.	x	x		
	CL augmentation				
	Trailing edge flaps and the reasons for use in take-off and landing: (a) influence on CL - α-graph; (b) different types of flaps; (c) flap asymmetry; (d) influence on pitch movement.	x	x		
	Leading edge devices and the reasons for use in take-off and landing	x	x		
	The boundary layer				
	Different types: (a) laminar; (b) turbulent.	x	x		
	Special circumstances				
	Ice and other contamination: (a) ice in stagnation point; (b) ice on the surface (frost, snow and clear ice); (c) rain; (d) contamination of the leading edge; (e) effects on stall; (f) effects on loss of controllability; (g) effects on control surface moment; (h) influence on high lift devices during take-off, landing and low speeds.	x	x		
	Stability				
	Condition of equilibrium in steady horizontal flight				
	Precondition for static stability	x	x		

		Aeroplane		Helicopter	
		PPL	Bridge course	PPL	Bridge course
	Equilibrium: (a) lift and weight; (b) drag and thrust.	x	x		
	Methods of achieving balance				
	Wing and empennage (tail and canard)	x	x		
	Control surfaces	x	x		
	Ballast or weight trim	x	x		
	Static and dynamic longitudinal stability				
	Basics and definitions: (a) static stability, positive, neutral and negative; (b) precondition for dynamic stability; (c) dynamic stability, positive, neutral and negative.	x	x		
	Location of centre of gravity: (a) aft limit and minimum stability margin; (b) forward position; (c) effects on static and dynamic stability.	x	x		
	Dynamic lateral or directional stability				
	Spiral dive and corrective actions	x	x		
	Control				
	General				
	Basics, the three planes and three axis	x	x		
	Angle of attack change	x	x		
	Pitch control				
	Elevator	x	x		
	Downwash effects	x	x		
	Location of centre of gravity	x	x		
	Yaw control				
	Pedal or rudder	x	x		
	Roll control				
	Ailerons: function in different phases of flight	x	x		
	Adverse yaw	x	x		
	Means to avoid adverse yaw: (a) frise ailerons; (b) differential ailerons deflection.	x	x		
	Means to reduce control forces				
	Aerodynamic balance: (a) balance tab and anti-balance tab; (b) servo tab.	x	x		
	Mass balance				
	Reasons to balance: means	x	x		
	Trimming				
	Reasons to trim	x	x		
	Trim tabs	x	x		

		Aeroplane		Helicopter	
		PPL	Bridge course	PPL	Bridge course
	Limitations				
	Operating limitations				
	Flutter	x	x		
	vfe	x	x		
	vno, vne	x	x		
	Manoeuvring envelope				
	Manoeuvring load diagram: (a) load factor; (b) accelerated stall speed; (c) va; (d) manoeuvring limit load factor or certification category.	x	x		
	Contribution of mass	x	x		
	Gust envelope				
	Gust load diagram	x	x		
	Factors contributing to gust loads	x	x		
	Propellers				
	Conversion of engine torque to thrust				
	Meaning of pitch	x	x		
	Blade twist	x	x		
	Effects of ice on propeller	x	x		
	Engine failure or engine stop				
	Windmilling drag	x	x		
	Moments due to propeller operation				
	Torque reaction	x	x		
	Asymmetric slipstream effect	x	x		
	Asymmetric blade effect	x	x		
	Flight mechanics				
	Forces acting on an aeroplane				
	Straight horizontal steady flight	x	x		
	Straight steady climb	x	x		
	Straight steady descent	x	x		
	Straight steady glide	x	x		
	Steady coordinated turn: (a) bank angle; (b) load factor; (c) turn radius; (d) rate one turn.	x	x		
5.2	**PRINCIPLES OF FLIGHT: HELICOPTER**				
	Subsonic aerodynamics				
	Basic concepts, laws and definitions			x	x
	Conversion of units			x	x
	Definitions and basic concepts about air:			x	x

		Aeroplane		Helicopter	
		PPL	Bridge course	PPL	Bridge course
	(a) the atmosphere and International Standard Atmosphere; (b) density; (c) influence of pressure and temperature on density.				
	Newton's laws: (a) Newton's second law: Momentum equation; (b) Newton's third law: action and reaction.			x	x
	Basic concepts about airflow: (a) steady airflow and unsteady airflow; (b) Bernoulli's equation; (c) static pressure, dynamic pressure, total pressure and stagnation point; (d) TAS and IAS; (e) two-dimensional airflow and three-dimensional airflow; (f) viscosity and boundary layer.			x	x
	Two-dimensional airflow			x	x
	Aerofoil section geometry: (a) aerofoil section; (b) chord line, thickness and thickness to chord ratio of a section; (c) camber line and camber; (d) symmetrical and asymmetrical aerofoils sections.			x	x
	Aerodynamic forces on aerofoil elements: (a) angle of attack; (b) pressure distribution; (c) lift and lift coefficient (d) relation lift coefficient: angle of attack; (e) profile drag and drag coefficient; (f) relation drag coefficient: angle of attack; (g) resulting force, centre of pressure and pitching moment.			x	x
	Stall: (a) boundary layer and reasons for stalling; (b) variation of lift and drag as a function of angle of attack; (c) displacement of the centre of pressure and pitching moment.			x	x
	Disturbances due to profile contamination: (a) ice contamination; (b) ice on the surface (frost, snow and clear ice).			x	x
	The three-dimensional airflow round a wing and a fuselage			x	x
	The wing: (a) planform, rectangular and tapered wings; (b) wing twist.			x	x
	Airflow pattern and influence on lift:			x	x
	(a) span wise flow on upper and lower surface;				

		Aeroplane		Helicopter	
		PPL	Bridge course	PPL	Bridge course
	(b) tip vortices; (c) span-wise lift distribution.				
	Induced drag: causes and vortices			x	x
	The airflow round a fuselage: (a) components of a fuselage; (b) parasite drag; (c) variation with speed.			x	x
	Transonic aerodynamics and compressibility effects				
	Airflow velocities			x	x
	Airflow speeds: (a) speed of sound; (b) subsonic, high subsonic and supersonic flows.			x	x
	Shock waves:			x	x
	(a) compressibility and shock waves; (b) the reasons for their formation at upstream high subsonic airflow; (c) their effect on lift and drag.				
	Influence of wing planform: sweep-angle			x	x
	Rotorcraft types			x	x
	Rotorcraft			x	x
	Rotorcraft types: (a) autogyro; (b) helicopter.			x	x
	Helicopters			x	x
	Helicopters configurations: the single main rotor helicopter			x	x
	The helicopter, characteristics and associated terminology: (a) general lay-out, fuselage, engine and gearbox; (b) tail rotor, fenestron and NOTAR; (c) engines (reciprocating and turbo shaft engines); (d) power transmission; (e) rotor shaft axis, rotor hub and rotor blades; (f) rotor disc and rotor disc area; (g) teetering rotor (two blades) and rotors with more than two blades; (h) skids and wheels; (i) helicopter axes and fuselage centre line; (j) roll axis, pitch axis and normal or yaw axis; (k) gross mass, gross weight and disc loading.			x	x
	Main rotor aerodynamics			x	x
	Hover flight outside ground effect			x	x
	Airflow through the rotor discs and round the blades: (a) circumferential velocity of the blade sections;			x	x

		Aeroplane		Helicopter	
		PPL	Bridge course	PPL	Bridge course
	(b) induced airflow, through the disc and downstream; (c) downward fuselage drag; (d) equilibrium of rotor thrust, weight and fuselage drag; (e) rotor disc induced power; (f) relative airflow to the blade; (g) pitch angle and angle of attack of a blade section; (h) lift and profile drag on the blade element; (i) resulting lift and thrust on the blade and rotor thrust; (j) collective pitch angle changes and necessity of blade feathering; (k) required total main rotor-torque and rotor-power; (l) influence of the air density.				
	Anti-torque force and tail rotor: (a) force of tail rotor as a function of main rotor-torque; (b) anti-torque rotor power; (c) necessity of blade feathering of tail rotor blades and yaw pedals.			x	x
	Maximum hover altitude OGE: (a) total power required and power available; (b) maximum hover altitude as a function of pressure altitude and OAT.			x	x
	Vertical climb			x	x
	Relative airflow and angles of attack: (a) climb velocity VC, induced and relative velocity and angle of attack; (b) collective pitch angle and blade feathering.			x	x
	Power and vertical speed: (a) induced power, climb power and profile power; (b) total main rotor power and main rotor torque; (c) tail rotor power; (d) total power requirement in vertical flight. Forward flight			x x	x x
	Airflow and forces in uniform inflow distribution: (a) assumption of uniform inflow distribution on rotor disc; (b) advancing blade (90°) and retreating blade (270°); (c) airflow velocity relative to the blade sections, area of reverse flow; (d) lift on the advancing and retreating blades at constant pitch angles; (e) necessity of cyclic pitch changes; (f) compressibility effects on the advancing blade tip and speed limitations; (g) high angle of attack on the retreating blade, blade stall and speed limitations; (h) thrust on rotor disc and tilt of thrust vector; (i) vertical component of the thrust vector and gross weight equilibrium;			x	x

		Aeroplane		Helicopter	
		PPL	Bridge course	PPL	Bridge course
	(j) horizontal component of the thrust vector and drag equilibrium.				
	The flare (power flight): (a) thrust reversal and increase in rotor thrust; (b) increase of rotor RPM on non-governed rotor.			x	x
	Power and maximum speed: (a) induced power as a function of helicopter speed; (b) rotor profile power as a function of helicopter speed; (c) fuselage drag and parasite power as a function of forward speed; (d) tail rotor power and power ancillary equipment; (e) total power requirement as a function of forward speed; (f) influence of helicopter mass, air density and drag of additional external equipment; (g) translational lift and influence on power required.			x	x
	Hover and forward flight in ground effect			x	x
	Airflow in ground effect and downwash: rotor power decrease as a function of rotor height above the ground at constant helicopter mass			x	x
	Vertical descent			x	x
	Vertical descent, power on: (a) airflow through the rotor, low and moderate descent speeds; (b) vortex ring state, settling with power and consequences.			x	x
	Autorotation: (a) collective lever position after failure; (b) up flow through the rotor, auto-rotation and anti-autorotation rings; (c) tail rotor thrust and yaw control; (d) control of rotor RPM with collective lever; (e) landing after increase of rotor thrust by pulling collective and reduction in vertical speed.			x	x
	Forward flight: Autorotation			x	x
	Airflow through the rotor disc: (a) descent speed and up flow through the disc; (b) the flare, increase in rotor thrust, reduction of vertical speed and ground speed.			x	x
	Flight and landing: (a) turning; (b) flare; (c) autorotative landing;			x	x
	(d) height or velocity avoidance graph and dead man's curve.				
	Main rotor mechanics			x	x
	Flapping of the blade in hover			x	x
	Forces and stresses on the blade:			x	x

		Aeroplane		Helicopter	
		PPL	Bridge course	PPL	Bridge course
	(a) centrifugal force on the blade and attachments; (b) limits of rotor RPM; (c) lift on the blade and bending stresses on a rigid attachment; (d) the flapping hinge of the articulated rotor and flapping hinge offset; (e) the flapping of the hinge less rotor and flexible element.				
	Coning angle in hover: (a) lift and centrifugal force in hover and blade weight negligible (b) flapping, tip path plane and disc area.			x	x
	Flapping angles of the blade in forward flight			x	x
	Forces on the blade in forward flight without cyclic feathering: (a) aerodynamic forces on the advancing and retreating blades without cyclic feathering; (b) periodic forces and stresses, fatigue and flapping hinge; (c) phase lag between the force and the flapping angle (about 90°); (d) flapping motion of the hinged blades and tilting of the cone and flap back of rotor; (e) rotor disc attitude and thrust vector tilt.			x	x
	Cyclic pitch (feathering) in helicopter mode, forward flight: (a) necessity of forward rotor disc tilt and thrust vector tilt; (b) flapping and tip path plane, virtual rotation axis or no flapping axis and plane of rotation; (c) shaft axis and hub plane; (d) cyclic pitch change (feathering) and rotor thrust vector tilt; (e) collective pitch change, collective lever, swash plate, pitch link and pitch horn; (f) cyclic stick, rotating swash plate and pitch link movement and phase angle.			x	x
	Blade lag motion			x	x
	Forces on the blade in the disc plane (tip path plane) in forward flight: (a) forces due to the Coriolis effect because of the flapping; (b) alternating stresses and the need of the drag or lag hinge. The drag or lag hinge: (a) the drag hinge in the fully articulated rotor; (b) the lag flexure in the hinge less rotor; (c) drag dampers.			x x	x x
	Ground resonance: (a) blade lag motion and movement of the centre of gravity of the blades and the rotor; (b) oscillating force on the fuselage; (c) fuselage, undercarriage and resonance.			x	x
	Rotor systems			x	x

		Aeroplane		Helicopter	
		PPL	Bridge course	PPL	Bridge course
	See-saw or teetering rotor			x	x
	Fully articulated rotor: (a) three hinges arrangement; (b) bearings and elastomeric hinges.			x	x
	Hinge less rotor and bearing less rotor			x	x
	Blade sailing: (a) low rotor RPM and effect of adverse wind; (b) minimising the danger; (d) droop stops.			x	x
	Vibrations due to main rotor: (a) origins of the vibrations: in plane and vertical; (b) blade tracking and balancing.			x	x
	Tail rotors			x	x
	Conventional tail rotor			x	x
	Rotor description: (a) two-blades tail rotors with teetering hinge; (b) rotors with more than two blades; (c) feathering bearings and flapping hinges; (d) dangers to people and to the tail rotor, rotor height and safety.			x	x
	Aerodynamics: (a) induced airflow and tail rotor thrust; (b) thrust control by feathering, tail rotor drift and roll; (c) effect of tail rotor failure and vortex ring.			x	x
	The fenestron: technical lay-out			x	x
	The NOTAR: technical lay-out			x	x
	Vibrations: high frequency vibrations due to the tail rotors			x	x
	Equilibrium, stability and control			x	x
	Equilibrium and helicopter attitudes			x	x
	Hover: (a) forces and equilibrium conditions; (b) helicopter pitching moment and pitch angle; (c) helicopter rolling moment and roll angle.			x	x
	Forward flight: (a) forces and equilibrium conditions; (b) helicopter moments and angles; (c) effect of speed on fuselage attitude.			x	x
	Control			x	x
	Control power (a) fully articulated rotor; (b) hinge less rotor;			x	x

		Aeroplane		Helicopter	
		PPL	Bridge course	PPL	Bridge course
	(c) teetering rotor.				
	Static and dynamic roll over			x	x
	Helicopter performances Engine performances			x	x
	Piston engines: (a) power available; (b) effects of density altitude.			x	x
	Turbine engines: (a) power available; (b) effects of ambient pressure and temperature.			x	x
	Helicopter performances			x	x
	Hover and vertical flight: (a) power required and power available; (b) OGE and IGE maximum hover height; (c) influence of AUM, pressure, temperature and density.			x	x
	Forward flight: (a) maximum speed; (b) maximum rate of climb speed; (c) maximum angle of climb speed; (d) range and endurance; (e) influence of AUM, pressure, temperature and density.			x	x
	Manoeuvring: (a) load factor; (b) bank angle and number of g's; (c) manoeuvring limit load factor.			x	x
	Special conditions: (a) operating with limited power; (b) over pitch and over torque.			x	x
6.	**OPERATIONAL PROCEDURES**				
	General				
	Operation of aircraft: ICAO Annex 6, General requirements				
	Definitions	x	x	x	x
	Applicability	x	x	x	x
	Special operational procedures and hazards (general aspects)	x	x	x	x
	Noise abatement				
	Noise abatement procedures	x	x	x	x
	Influence of the flight procedure (departure, cruise and approach)	x	x	x	x
	Runway incursion awareness (meaning of surface markings and signals)	x	x	x	x

		Aeroplane		Helicopter	
		PPL	Bridge course	PPL	Bridge course
	Fire or smoke				
	Carburettor fire	x	x	x	x
	Engine fire	x	x	x	x
	Fire in the cabin and cockpit, (choice of extinguishing agents according to fire classification and use of the extinguishers)	x	x	x	x
	Smoke in the cockpit and (effects and action to be taken) and smoke in the cockpit and cabin (effects and actions taken)	x	x	x	x
	Windshear and microburst				
	Effects and recognition during departure and approach	x	x	x	x
	Actions to avoid and actions taken during encounter	x	x	x	x
	Wake turbulence				
	Cause	x	x	x	x
	List of relevant parameters	x	x	x	x
	Actions taken when crossing traffic, during take-off and landing	x	x	x	x
	Emergency and precautionary landings				
	Definition	x	x	x	x
	Cause	x	x	x	x
	Passenger information	x	x	x	x
	Evacuation	x	x	x	x
	Action after landing	x	x	x	x
	Contaminated runways				
	Kinds of contamination	x	x		
	Estimated surface friction and friction coefficient	x	x		
	Rotor downwash			x	x
	Operation influence by meteorological conditions (helicopter)				
	White out, sand or dust			x	x
	Strong winds			x	x
	Mountain environment			x	x
	Emergency procedures				
	Influence by technical problems				
	Engine failure			x	x
	Fire in cabin, cockpit or engine			x	x
	Tail, rotor or directional control failure			x	x
	Ground resonance			x	x
	Blade stall			x	x
	Settling with power (vortex ring)			x	x
	Overpitch			x	x
	Overspeed: rotor or engine			x	x
	Dynamic rollover			x	x
	Mast bumping			x	x
7.	**FLIGHT PERFORMANCE AND PLANNING**				
7.1.	**MASS AND BALANCE: AEROPLANES OR HELICOPTERS**				
	Purpose of mass and balance considerations				
	Mass limitations				

		Aeroplane		Helicopter	
		PPL	Bridge course	PPL	Bridge course
	Importance in regard to structural limitations	x	x	x	x
	Importance in regard to performance limitations	x	x	x	x
	CG limitations				
	Importance in regard to stability and controllability	x	x	x	x
	Importance in regard to performance	x	x	x	x
	Loading				
	Terminology				
	Mass terms	x	x	x	x
	Load terms (including fuel terms)	x	x	x	x
	Mass limits				
	Structural limitations	x	x	x	x
	Performance limitations	x	x	x	x
	Baggage compartment limitations	x	x	x	x
	Mass calculations				
	Maximum masses for take-off and landing	x	x	x	x
	Use of standard masses for passengers, baggage and crew	x	x	x	x
	Fundamentals of CG calculations				
	Definition of centre of gravity	x	x	x	x
	Conditions of equilibrium (balance of forces and balance of moments)	x	x	x	x
	Basic calculations of CG	x	x	x	x
	Mass and balance details of aircraft				
	Contents of mass and balance documentation				
	Datum and moment arm	x	x	x	x
	CG position as distance from datum	x	x	x	x
	Extraction of basic mass and balance data from aircraft documentation				
	BEM	x	x	x	x
	CG position or moment at BEM	x	x	x	x
	Deviations from standard configuration	x	x	x	x
	Determination of CG position				
	Methods				
	Arithmetic method	x	x	x	x
	Graphic method	x	x	x	x
	Load and trim sheet				
	General considerations	x	x	x	x
	Load sheet and CG envelope for light aeroplanes and for helicopters	x	x	x	x
7.2.	**PERFORMANCE: AEROPLANES**				
	Introduction				
	Performance classes	x	x		
	Stages of flight	x	x		
	Effect of aeroplane mass, wind, altitude, runway slope and runway conditions	x	x		
	Gradients	x	x		
	SE aeroplanes				

		Aeroplane		Helicopter	
		PPL	Bridge course	PPL	Bridge course
	Definitions of terms and speeds	x	x		
	Take-off and landing performance				
	Use of aeroplane flight manual data	x	x		
	Climb and cruise performance				
	Use of aeroplane flight data	x	x		
	Effect of density altitude and aeroplane mass	x	x		
	Endurance and the effects of the different recommended power or thrust settings	x	x		
	Still air range with various power or thrust settings	x	x		
7.3.	**FLIGHT PLANNING AND FLIGHT MONITORING**				
	Flight planning for VFR flights				
	VFR navigation plan				
	Routes, airfields, heights and altitudes from VFR charts	x	x	x	x
	Courses and distances from VFR charts	x	x	x	x
	Aerodrome charts and aerodrome directory	x	x	x	x
	Communications and radio navigation planning data	x	x	x	x
	Completion of navigation plan	x	x	x	x
	Fuel planning				
	General knowledge	x	x	x	x
	Pre-flight calculation of fuel required				
	Calculation of extra fuel	x	x	x	x
	Completion of the fuel section of the navigation plan (fuel log) and calculation of total fuel	x	x	x	x
	Pre-flight preparation				
	AIP and NOTAM briefing				
	Ground facilities and services	x	x	x	x
	Departure, destination and alternate aerodromes	x	x	x	x
	Airway routings and airspace structure	x	x	x	x
	Meteorological briefing				
	Extraction and analysis of relevant data from meteorological documents	x	x	x	x
	ICAO flight plan (ATS flight plan)				
	Individual flight plan				
	Format of flight plan	x	x	x	x
	Completion of the flight plan	x	x	x	x
	Submission of the flight plan	x	x	x	x
	Flight monitoring and in-flight replanning				
	Flight monitoring				
	Monitoring of track and time	x	x	x	x
	In-flight fuel management	x	x	x	x
	In-flight re-planning in case of deviation from planned data	x	x	x	x
7.4.	**PERFORMANCE: HELICOPTERS**				
	General				
	Introduction				

		Aeroplane		Helicopter	
		PPL	Bridge course	PPL	Bridge course
	Stages of flight			x	x
	Effect on performance of atmospheric, airport or heliport and helicopter conditions			x	x
	Applicability of airworthiness requirements			x	x
	Definitions and terminology			x	x
	Performance: SE helicopters				
	Definitions of terms (a) masses; (b) velocities: vx, vy; (c) velocity of best range and of maximum endurance; (d) power limitations; (e) altitudes.			x	x
	Take-off, cruise and landing performance **Use and interpretation of diagrams and tables:** (a) Take-off: (1) take-off run and distance available; (2) take-off and initial climb; (3) effects of mass, wind and density altitude; (4) effects of ground surface and gradient. (b) Landing: (1) effects of mass, wind, density altitude and approach speed; (2) effects of ground surface and gradient. (c) In-flight: (1) relationship between power required and power available; (5) performance diagram; (2) effects of configuration, mass, temperature and altitude; (6) reduction of performance during climbing turns; (7) autorotation; **(3)** adverse effects (icing, rain and condition of the airframe).			x	x
8.	**AIRCRAFT GENERAL KNOWLEDGE**				
8.1.	**AIRFRAME AND SYSTEMS, ELECTRICS, POWERPLANT AND EMERGENCY EQUIPMENT**				
	System design, loads, stresses, maintenance				
	Loads and combination loadings applied to an aircraft's structure	x	x	x	x
	Airframe				
	Wings, tail surfaces and control surfaces				
	Design and constructions	x	x		
	Structural components and materials	x	x		
	Stresses	x	x		
	Structural limitations	x	x		
	Fuselage, doors, floor, wind-screen and windows				
	Design and constructions	x	x	x	x

		Aeroplane		Helicopter	
		PPL	Bridge course	PPL	Bridge course
	Structural components and materials	x	x	x	x
	Stresses	x	x	x	x
	Structural limitations	x	x	x	x
	Flight and control surfaces				
	Design and constructions			x	x
	Structural components and materials			x	x
	Stresses and aero elastic vibrations			x	x
	Structural limitations			x	x
	Hydraulics				
	Hydromechanics: basic principles	x	x	x	x
	Hydraulic systems	x	x	x	x
	Hydraulic fluids: types and characteristics, limitations	x	x	x	x
	System components: design, operation, degraded modes of operation, indications and warnings	x	x	x	x
	Landing gear, wheels, tyres and brakes				
	Landing gear				
	Types and materials	x	x	x	x
	Nose wheel steering: design and operation	x	x		
	Brakes				
	Types and materials	x	x	x	x
	System components: design, operation, indications and warnings	x	x	x	x
	Wheels and tyres				
	Types and operational limitations	x	x	x	x
	Helicopter equipments			x	x
	Flight controls				
	Mechanical or powered	x	x	x	x
	Control systems and mechanical	x	x	x	x
	System components: design, operation, indications and warnings, degraded modes of operation and jamming	x	x	x	x
	Secondary flight controls				
	System components: design, operation, degraded modes of operation, indications and warnings	x	x		
	Anti-icing systems				
	Types and operation (pitot and windshield)	x	x	x	x
	Fuel system				
	Piston engine				
	System components: design, operation, degraded modes of operation, indications and warnings	x	x	x	x
	Turbine engine				
	System components: design, operation, degraded modes of operation, indications and warnings			x	x
	Electrics				
	Electrics: general and definitions				

		Aeroplane		Helicopter	
		PPL	Bridge course	PPL	Bridge course
	Direct current: voltage, current, resistance, conductivity, Ohm's law, power and work	x	x	x	x
	Alternating current: voltage, current, amplitude, phase, frequency and resistance	x	x	x	x
	Circuits: series and parallel	x	x	x	x
	Magnetic field: effects in an electrical circuit	x	x	x	x
	Batteries				
	Types, characteristics and limitations	x	x	x	x
	Battery chargers, characteristics and limitations	x	x	x	x
	Static electricity: general				
	Basic principles	x	x	x	x
	Static dischargers	x	x	x	x
	Protection against interference	x	x	x	x
	Lightning effects	x	x	x	x
	Generation: production, distribution and use				
	DC generation: types, design, operation, degraded modes of operation, indications and warnings	x	x	x	x
	AC generation: types, design, operation, degraded modes of operation, indications and warnings	x	x	x	x
	Electric components				
	Basic elements: basic principles of switches, circuit-breakers and relays	x	x	x	x
	Distribution				
	General: (a) bus bar, common earth and priority; (b) AC and DC comparison.	x	x	x	x
	Piston engines				
	General				
	Types of internal combustion engine: basic principles and definitions	x	x	x	x
	Engine: design, operation, components and materials	x	x	x	x
	Fuel				
	Types, grades, characteristics and limitations	x	x	x	x
	Alternate fuel: characteristics and limitations	x	x	x	x
	Carburettor or injection system				
	Carburettor: design, operation, degraded modes of operation, indications and warnings	x	x	x	x
	Injection: design, operation, degraded modes of operation, indications and warnings	x	x	x	x
	Icing	x	x	x	x
	Air cooling systems				
	Design, operation, degraded modes of operation, indications and warnings	x	x	x	x
	Lubrication systems				

		Aeroplane		Helicopter	
		PPL	Bridge course	PPL	Bridge course
	Lubricants: types, characteristics and limitations	x	x	x	x
	Design, operation, degraded modes of operation, indications and warnings	x	x	x	x
	Ignition circuits				
	Design, operation, degraded modes of operation	x	x	x	x
	Mixture				
	Definition, characteristic mixtures, control instruments, associated control levers and indications	x	x	x	x
	Propellers				
	Definitions and general: (a) aerodynamic parameters; (b) types; (c) operating modes.	x	x		
	Constant speed propeller: design, operation and system components	x	x		
	Propeller handling: associated control levers, degraded modes of operation, indications and warnings	x	x		
	Performance and engine handling				
	Performance: influence of engine parameters, influence of atmospheric conditions, limitations and power augmentation systems	x	x	x	x
	Engine handling: power and mixture settings during various flight phases and operational limitations	x	x	x	x
	Turbine engines				
	Definitions			x	x
	Coupled turbine engine: design, operation, components and materials			x	x
	Free turbine engine: design, operation, components and materials			x	x
	Fuel				
	Types, characteristics and limitations			x	x
	Main engine components				
	Compressor: (a) types, design, operation, components and materials; (b) stresses and limitations; (c) stall, surge and means of prevention.			x	x
	Combustion chamber: (a) types, design, operation, components and materials; (b) stresses and limitations; (c) emission problems.			x	x
	Turbine: (a) types, design, operation, components and materials; (b) stresses, creep and limitations.			x	x
	Exhaust: (a) design, operation and materials; (b) noise reduction.			x	x
	Fuel control units: types, operation and sensors			x	x

		Aeroplane		Helicopter	
		PPL	Bridge course	PPL	Bridge course
	Helicopter air intake: different types, design, operation, materials and optional equipments			x	x
	Additional components and systems				
	Helicopter additional components and systems: lubrication system, ignition circuit, starter, accessory gearbox, free wheel units: design, operation and components			x	x
	Performance aspects				
	Torque, performance aspects, engine handling and limitations: (a) engine ratings; (b) engine performance and limitations; (c) engine handling.			x	x
	Protection and detection systems				
	Fire detection systems				
	Operation and indications			x	X
	Miscellaneous systems				
	Rotor design			x	x
	Rotor heads				
	Main rotor				
	Types			x	x
	Structural components and materials, stresses and structural limitations			x	x
	Design and construction			x	x
	Adjustment			x	x
	Tail rotor				
	Types			x	x
	Structural components and materials, stresses and structural limitations			x	x
	Design and construction			x	x
	Adjustment			x	x
	Transmission				
	Main gear box				
	Different types, design, operation and limitations			x	x
	Rotor brake				
	Different types, design, operation and limitations			x	x
	Auxiliary systems			x	x
	Drive shaft and associated installation			x	x
	Intermediate and tail gear box				
	Different types, design, operation and limitations			x	x
	Blades				
	Main rotor blade				
	Design and construction			x	x
	Structural components and materials			x	x
	Stresses			x	x
	Structural limitations			x	x

		Aeroplane		Helicopter	
		PPL	Bridge course	PPL	Bridge course
	Adjustment			x	x
	Tip shape			x	x
	Tail rotor blade				
	Design and construction			x	x
	Structural components and materials			x	x
	Stresses			x	x
	Structural limitations			x	x
	Adjustment			x	x
8.2.	**INSTRUMENTATION**				
	Instrument and indication systems				
	Pressure gauge				
	Different types, design, operation, characteristics and accuracy	x	x	x	x
	Temperature sensing				
	Different types, design, operation, characteristics and accuracy	x	x	x	x
	Fuel gauge				
	Different types, design, operation, characteristics and accuracy	x	x	x	x
	Flow meter				
	Different types, design, operation, characteristics and accuracy	x	x	x	x
	Position transmitter				
	Different types, design, operation, characteristics and accuracy	x	x	x	x
	Torque meter				
	Design, operation, characteristics and accuracy			x	x
	Tachometer				
	Design, operation, characteristics and accuracy	x	x	x	x
	Measurement of aerodynamic parameters				
	Pressure measurement				
	Static pressure, dynamic pressure, density and definitions	x	x	x	x
	Design, operation, errors and accuracy	x	x	x	x
	Temperature measurement: aeroplane				
	Design, operation, errors and accuracy	x	x		
	Displays	x	x		
	Temperature measurement: helicopter				
	Design, operation, errors and accuracy			x	x
	Displays			x	x
	Altimeter				
	Standard atmosphere	x	x	x	x
	The different barometric references (QNH, QFE and 1013.25)	x	x	x	x
	Height, indicated altitude, true altitude, pressure altitude and density altitude	x	x	x	x
	Design, operation, errors and accuracy	x	x	x	x
	Displays	x	x	x	x
	Vertical speed indicator				
	Design, operation, errors and accuracy	x	x	x	x
	Displays	x	x	x	x

		Aeroplane		Helicopter	
		PPL	Bridge course	PPL	Bridge course
	Air speed indicator				
	The different speeds IAS, CAS, TAS: definition, usage and relationships	x	x	x	x
	Design, operation, errors and accuracy	x	x	x	x
	Displays	x	x	x	x
	Magnetism: direct reading compass				
	Earth magnetic field	x	x	x	x
	Direct reading compass				
	Design, operation, data processing, accuracy and deviation	x	x	x	x
	Turning and acceleration errors	x	x	x	x
	Gyroscopic instruments				
	Gyroscope: basic principles				
	Definitions and design	x	x	x	x
	Fundamental properties	x	x	x	x
	Drifts	x	x	x	x
	Turn and bank indicator				
	Design, operation and errors	x	x	x	x
	Attitude indicator				
	Design, operation, errors and accuracy	x	x	x	x
	Directional gyroscope				
	Design, operation, errors and accuracy	x	x	x	x
	Communication systems				
	Transmission modes: VHF, HF and SATCOM				
	Principles, bandwidth, operational limitations and use	x	x	x	x
	Voice communication				
	Definitions, general and applications	x	x	x	x
	Alerting systems and proximity systems				
	Flight warning systems				
	Design, operation, indications and alarms	x	x	x	x
	Stall warning				
	Design, operation, indications and alarms	x	x		
	Radio-altimeter				
	Design, operation, errors, accuracy and indications			x	x
	Rotor or engine over speed alert system				
	Design, operation, displays and alarms			x	x
	Integrated instruments: electronic displays				
	Display units				
	Design, different technologies and limitations	x	x	x	x
9.	**NAVIGATION**				
9.1	**GENERAL NAVIGATION**				
	Basics of navigation				
	The solar system				
	Seasonal and apparent movements of the sun	x		x	
	The earth				
	Great circle, small circle and rhumb line	x		x	

		Aeroplane		Helicopter	
		PPL	Bridge course	PPL	Bridge course
	Latitude and difference of latitude	x		x	
	Longitude and difference of longitude	x		x	
	Use of latitude and longitude co-ordinates to locate any specific position	x		x	
	Time and time conversions				
	Apparent time	x		x	
	UTC	x		x	
	LMT	x		x	
	Standard times	x		x	
	Dateline	x		x	
	Definition of sunrise, sunset and civil twilight	x		x	
	Directions				
	True north, magnetic north and compass north	x		x	
	Compass deviation	x		x	
	Magnetic poles, isogonals, relationship between true and magnetic	x		x	
	Distance				
	Units of distance and height used in navigation: nautical miles, statute miles, kilometres, metres and ft	x		x	
	Conversion from one unit to another	x		x	
	Relationship between nautical miles and minutes of latitude and minutes of longitude	x		x	
	Magnetism and compasses				
	General principles				
	Terrestrial magnetism	x		x	
	Resolution of the earth's total magnetic force into vertical and horizontal components	x		x	
	Variation-annual change	x		x	
	Aircraft magnetism				
	The resulting magnetic fields	x		x	
	Keeping magnetic materials clear of the compass	x		x	
	Charts				
	General properties of miscellaneous types of projections				
	Direct Mercator	x		x	
	Lambert conformal conic	x		x	
	The representation of meridians, parallels, great circles and rhumb lines				
	Direct Mercator	x		x	
	Lambert conformal conic	x		x	
	The use of current aeronautical charts				
	Plotting positions	x		x	
	Methods of indicating scale and relief (ICAO topographical chart)	x		x	
	Conventional signs	x		x	
	Measuring tracks and distances	x		x	
	Plotting bearings and distances	x		x	

		Aeroplane		Helicopter	
		PPL	Bridge course	PPL	Bridge course
	DR navigation				
	Basis of DR				
	Track	x		x	
	Heading (compass, magnetic and true)	x		x	
	Wind velocity	x		x	
	Air speed (IAS, CAS and TAS)	x		x	
	Groundspeed	x		x	
	ETA	x		x	
	Drift and wind correction angle	x		x	
	DR position fix	x		x	
	Use of the navigational computer				
	Speed	x		x	
	Time	x		x	
	Distance	x		x	
	Fuel consumption	x		x	
	Conversions	x		x	
	Air speed	x		x	
	Wind velocity	x		x	
	True altitude	x		x	
	The triangle of velocities				
	Heading	x		x	
	Ground speed	x		x	
	Wind velocity	x		x	
	Track and drift angle	x		x	
	Measurement of DR elements				
	Calculation of altitude	x		x	
	Determination of appropriate speed	x		x	
	In-flight navigation				
	Use of visual observations and application to in-flight navigation	x		x	
	Navigation in cruising flight, use of fixes to revise navigation data				
	Ground speed revision	x		x	
	Off-track corrections	x		x	
	Calculation of wind speed and direction	x		x	
	ETA revisions	x		x	
	Flight log	x		x	
9.2	**RADIO NAVIGATION**				
	Basic radio propagation theory				
	Antennas				
	Characteristics	x		x	
	Wave propagation				
	Propagation with the frequency bands	x		x	
	Radio aids				
	Ground DF				

		Aeroplane		Helicopter	
		PPL	Bridge course	PPL	Bridge course
	Principles	x		x	
	Presentation and interpretation	x		x	
	Coverage	x		x	
	Range	x		x	
	Errors and accuracy	x		x	
	Factors affecting range and accuracy	x		x	
	NDB/ADF				
	Principles	x		x	
	Presentation and interpretation	x		x	
	Coverage	x		x	
	Range	x		x	
	Errors and accuracy	x		x	
	Factors affecting range and accuracy	x		x	
	VOR				
	Principles	x		x	
	Presentation and interpretation	x		x	
	Coverage	x		x	
	Range	x		x	
	Errors and accuracy	x		x	
	Factors affecting range and accuracy	x		x	
	DME				
	Principles	x		x	
	Presentation and interpretation	x		x	
	Coverage	x		x	
	Range	x		x	
	Errors and accuracy	x		x	
	Factors affecting range and accuracy	x		x	
	Radar				
	Ground radar				
	Principles	x		x	
	Presentation and interpretation	x		x	
	Coverage	x		x	
	Range	x		x	
	Errors and accuracy	x		x	
	Factors affecting range and accuracy	x		x	
	Secondary surveillance radar and transponder				

		Aeroplane		Helicopter	
		PPL	Bridge course	PPL	Bridge course
	Principles	x		x	
	Presentation and interpretation	x		x	
	Modes and codes	x		x	
	GNSS				
	GPS, GLONASS OR GALILEO				
	Principles	x		x	
	Operation	x		x	
	Errors and accuracy	x		x	
	Factors affecting accuracy	x		x	

AMC2 FCL.210; FCL.215

SYLLABUS OF THEORETICAL KNOWLEDGE FOR THE PPL(AS)

The following table contains the syllabi for the courses of theoretical knowledge, as well as for the theoretical knowledge examinations for the PPL(As). The training and examination should cover aspects related to non-technical skills in an integrated manner, taking into account the particular risks associated to the licence and the activity.

		PPL
1.	**AIR LAW AND ATC PROCEDURES**	
	International law: conventions, agreements and organisations	x
	Airworthiness of aircraft	x
	Aircraft nationality and registration marks	x
	Personnel licensing	x
	Rules of the air	x
	Procedures for air navigation services: aircraft operations	x
	Air traffic services and air traffic management	x
	Aeronautical information service	x
	Aerodromes	x
	Search and rescue	x
	Security	x
	Aircraft accident and incident investigation	x
	National law	x
2.	**HUMAN PERFORMANCE**	
	Human factors: basic concepts	x
	Basic aviation physiology and health maintenance	x
	Basic aviation psychology	x
3.	**METEOROLOGY**	
	The atmosphere	x
	Wind	x
	Thermodynamics	x
	Clouds and fog	x
	Precipitation	x
	Air masses and fronts	x
	Pressure systems	x
	Climatology	x
	Flight hazards	x
	Meteorological information	x
4.	**COMMUNICATIONS**	
	VFR COMMUNICATIONS	
	Definitions	x
	General operating procedures	x
	Relevant weather information terms (VFR)	x
	Action required to be taken in case of communication failure	x
	Distress and urgency procedures	x
	General principles of VHF propagation and allocation of frequencies	x
5.	**PRINCIPLES OF FLIGHT**	
	Basics of aerostatics	x
	Basics of subsonic aerodynamics	x

	Aerodynamics of airships	x
	Stability	x
	Controllability	x
	Limitations	x
	Propellers	x
	Basics of airship flight mechanics	x
6.	**OPERATIONAL PROCEDURES**	
	General requirements	x
	Special operational procedures and hazards (general aspects)	x
	Emergency procedures	x
7.	**FLIGHT PERFORMANCE AND PLANNING**	
7.1	**MASS AND BALANCE**	
	Purpose of mass and balance considerations	x
	Loading	x
	Fundamentals of CG calculations	x
	Mass and balance details of aircraft	x
	Determination of CG position	x
	Passenger, cargo and ballast handling	x
7.2	PERFORMANCE	
	Airworthiness requirements	x
	Basics of airship performance	x
	Definitions and terms	x
	Stages of flight	x
	Use of flight manual	x
7.3	**FLIGHT PLANNING AND FLIGHT MONITORING**	
	Flight planning for VFR flights	x
	Fuel planning	x
	Pre-flight preparation	x
	ATS flight plan	x
	Flight monitoring and in-flight re-planning	x
8.	**AIRCRAFT GENERAL KNOWLEDGE**	
8.1	**ENVELOPE, AIRFRAME AND SYSTEMS, ELECTRICS, POWERPLANT AND EMERGENCY EQUIPMENT**	
	Design, materials, loads and stresses	x
	Envelope and airbags	x
	Framework	x
	Gondola	x
	Flight controls	x
	Landing gear	x
	Hydraulics and pneumatics	x
	Heating and air conditioning	x
	Fuel system	x
	Piston engines (propellers)	x
	Turbine engines (basics)	x
	Electrics	x
	Fire protection and detection systems	x
	Maintenance	x
8.2	**INSTRUMENTATION**	

	Sensors and instruments	x
	Measurement of air data and gas parameters	x
	Magnetism: direct reading compass and flux valve	x
	Gyroscopic instruments	x
	Communication systems	x
	Alerting systems	x
	Integrated instruments: electronic displays	x
	Flight management system (general basics)	x
	Digital circuits and computers	x
9.	**NAVIGATION**	
9.1.	**GENERAL NAVIGATION**	
	Basics of navigation	x
	Magnetism and compasses	x
	Charts	x
	DR navigation	x
	In-flight navigation	x
9.2.	**RADIO NAVIGATION**	
	Basic radio propagation theory	x
	Radio aids	x
	Radar	x
	GNSS	x

AMC3 FCL.210; FCL.215 - Training course and theoretical knowledge examination

SYLLABUS OF THEORETICAL KNOWLEDGE FOR THE BPL AND GPL

The syllabi for the theoretical knowledge instruction and examination for the LAPL(B) and LAPL(G) in AMC1 FCL.115; FCL.120 should be used for the BPL and GPL, respectively.

AMC1 FCL.125; FCL.235

CONTENTS OF THE SKILL TEST FOR THE ISSUE OF A LAPL(G) AND OF AN GPL

(a) An applicant should be responsible for the flight planning and should ensure that all equipment and documentation for the execution of the flight are on board.

(b) The applicant should indicate to the FE the checks and duties carried out. Checks should be completed in accordance with the flight manual or the authorised checklist for the glider on which the test is being taken.

FLIGHT TEST TOLERANCE

(c) The applicant should demonstrate the ability to:

(1) operate the glider within its limitations;

(2) complete all manoeuvres with smoothness and accuracy;

(3) exercise good judgment and airmanship;

(4) apply aeronautical knowledge;

(5) maintain control of the glider at all times in such a manner that the successful outcome of a procedure or manoeuvre is never seriously in doubt.

CONTENT OF THE SKILL TEST

(d) The skill test contents and sections set out in this AMC should be used for the skill test for the issue of a LAPL(G) and of an GPL:

SECTION 1 PRE-FLIGHT OPERATIONS AND DEPARTURE	
Use of checklist, airmanship (control of glider by external visual reference), look-out. Apply in all sections.	
a	Pre-flight glider (daily) inspection, documentation, NOTAM and weather briefing
b	Verifying in-limits mass and balance and performance calculation
c	Glider servicing compliance
c	Glider servicing compliance
d	Pre-take-off checks
SECTION 2 LAUNCH METHOD Note: at least for one of the three launch methods all the mentioned items are fully exercised during the skill test	
SECTION 2 (A) WINCH OR CAR LAUNCH	
a	Signals before and during launch, including messages to winch driver
b	Adequate profile of winch launch
c	Simulated launch failure
d	Situational awareness
SECTION 2 (B) AEROTOW LAUNCH	
a	Signals before and during launch, including signals to or communications with tow plane pilot for any problems
b	Initial roll and take-off climb
c	Launch abandonment (simulation only or 'talk-through')
d	Correct positioning during straight flight and turns
e	Out of position and recovery
f	Correct release from tow
g	Look-out and airmanship through whole launch phase
SECTION 2 (C) SELF-LAUNCH (powered gliders only)	
a	ATC compliance (if applicable)
b	Aerodrome departure procedures
c	Initial roll and take-off climb
d	Look-out and airmanship during the whole take-off
e	Simulated engine failure after take-off

f	Engine shut down and stowage
SECTION 3 GENERAL AIRWORK	
a	Maintain straight flight: attitude and speed control
b	Coordinated medium (30 ° bank) turns, look-out procedures and collision avoidance
c	Turning on to selected headings visually and with use of compass
d	Flight at high angle of attack (critically low air speed)
e	Clean stall and recovery
f	Spin avoidance and recovery
g	Steep (45 ° bank) turns, look-out procedures and collision avoidance
h	Local area navigation and awareness
SECTION 4 CIRCUIT, APPROACH AND LANDING	
a	Aerodrome circuit joining procedure
b	Collision avoidance: look-out procedures
c	Pre-landing checks
d	Circuit, approach control and landing
e	Precision landing (simulation of out-landing and short field)
f	Crosswind landing if suitable conditions available

AMC2 FCL.125; FCL.235

CONTENTS OF THE SKILL TEST FOR THE ISSUE OF A LAPL (B) AND A BPL

(a) The take-off site should be chosen by the applicant depending on the actual meteorological conditions, the area which has to be over flown and the possible options for suitable landing sites. The applicant should be responsible for the flight planning and should ensure that all equipment and documentation for the execution of the flight are on board.

(b) An applicant should indicate to the FE the checks and duties carried out. Checks should be completed in accordance with the flight manual or the authorised checklist for the balloon on which the test is being taken. During pre-flight preparation for the test the applicant should be required to perform crew and passenger briefings and demonstrate crowd control. The load calculation should be performed by the applicant in compliance with the operations manual or flight manual for the balloon used.

FLIGHT TEST TOLERANCE

(c) The applicant should demonstrate the ability to:

(1) operate the balloon within its limitations;

(2) complete all manoeuvres with smoothness and accuracy

(3) exercise good judgment and airmanship;

(4) apply aeronautical knowledge;

(5) maintain control of the balloon at all times in such a manner that the successful outcome of a procedure or manoeuvre is never seriously in doubt.

CONTENT OF THE SKILL TEST

(d) The skill test contents and sections set out in this paragraph should be used for the skill test for the issue of a LAPL(B) (hot-air balloon) and a BPL (hot-air balloon):

SECTION 1 PRE-FLIGHT OPERATIONS, INFLATION AND TAKE-OFF	
Use of checklist, airmanship, control of balloon by external visual reference, look-out procedures, etc. apply in all sections.	
a	Pre-flight documentation, flight planning, NOTAM and weather briefing
b	Balloon inspection and servicing
c	Load calculation
d	Crowd control, crew and passenger briefings
e	Assembly and layout
f	Inflation and pre-take-off procedures
g	Take-off
h	ATC compliance(if applicable)
SECTION 2 GENERAL AIRWORK	
a	Climb to level flight
b	Level flight
c	Descent to level flight
d	Operating at low level
e	ATC compliance (if applicable)
SECTION 3 EN-ROUTE PROCEDURES	
a	Dead reckoning and map reading
b	Marking positions and time
c	Orientation and airspace structure
d	Maintenance of altitude
e	Fuel management
f	Communication with retrieve crew
g	ATC compliance
SECTION 4 APPROACH AND LANDING PROCEDURES	

a	Approach from low level, missed approach and fly on
b	Approach from high level, missed approach and fly on
c	Pre-landing checks
d	Passenger pre-landing briefing
e	Selection of landing field
f	Landing, dragging and deflation
g	ATC compliance (if applicable)
h	Actions after flight
SECTION 5 ABNORMAL AND EMERGENCY PROCEDURES	
a	Simulated fire on the ground and in the air
b	Simulated pilot light and burner failures
c	Other abnormal and emergency procedures as outlined in the appropriate flight manual.
d	Oral questions

(e) The skill test contents and sections set out in this paragraph should be used for the skill test for the issue of a LAPL(B) (gas balloon) and a BPL (gas balloon):

SECTION 1 PRE-FLIGHT OPERATIONS, INFLATION AND TAKE-OFF	
Use of checklist, airmanship, control of balloon by external visual reference, look-out procedures, etc. apply in all sections.	
a	Pre-flight documentation, flight planning, NOTAM and weather briefing
b	Balloon inspection and servicing
c	Load calculation
d	Crowd control, crew and passenger briefings
e	Assembly and layout
f	Inflation and pre-take-off procedures
g	Take-off
h	ATC compliance (if applicable)
SECTION 2 GENERAL AIRWORK	
a	Climb to level flight
b	Level flight
c	Descent to level flight
d	Operating at low level

e	ATC compliance (if applicable)
SECTION 3 EN-ROUTE PROCEDURES	
a	Dead reckoning and map reading
b	Marking positions and time
c	Orientation and airspace structure
d	Maintenance of altitude
e	Ballast management
f	Communication with retrieve crew
g	ATC compliance
SECTION 4 APPROACH AND LANDING PROCEDURES	
a	Approach from low level, missed approach and fly on
b	Approach from high level, missed approach and fly on
c	Pre-landing checks
d	Passenger pre-landing briefing
e	Selection of landing field
f	Landing, dragging and deflation
g	ATC compliance (if applicable)
h	Actions after flight
SECTION 5 ABNORMAL AND EMERGENCY PROCEDURES	
a	Simulated closed appendix during take-off and climb
b	Simulated parachute or valve failure
c	Other abnormal and emergency procedures as outlined in the appropriate flight manual
d	Oral questions

AMC1 FCL.215; FCL.235

THEORETICAL KNOWLEDGE EXAMINATION AND SKILL TEST FOR THE PPL

(a) Theoretical knowledge examination

(1) The examinations should comprise a total of 120 multiple-choice questions covering all the subjects.

(2) Communication practical classroom testing may be conducted.

(3) The period of 18 months mentioned in FCL.025(b)(2) should be counted from the end of the calendar month when the applicant first attempted an examination.

(b) Skill test

Further training may be required following any failed skill test or part thereof. There should be no limit to the number of skill tests that may be attempted.

(c) Conduct of the test

(1) If the applicant chooses to terminate a skill test for reasons considered inadequate by the FE, the applicant should retake the entire skill test. If the test is terminated for reasons considered adequate by the FE, only those sections not completed should be tested in a further flight.

(2) Any manoeuvre or procedure of the test may be repeated once by the applicant. The FE may stop the test at any stage if it is considered that the applicant's demonstration of flying skill requires a complete retest.

(3) An applicant should be required to fly the aircraft from a position where the PIC functions can be performed and to carry out the test as if there is no other crew member. Responsibility for the flight should be allocated in accordance with national regulations.

AMC1 FCL.235 - Skill test

CONTENTS OF THE SKILL TEST FOR THE ISSUE OF A PPL(A)

(a) The route to be flown for the navigation test should be chosen by the FE. The route may end at the aerodrome of departure or at another aerodrome. The applicant should be responsible for the flight planning and should ensure that all equipment and documentation for the execution of the flight are on board. The navigation section of the test should have a duration that allows the pilot to demonstrate his/her ability to complete a route with at least three identified waypoints and may, as agreed between the applicant and FE, be flown as a separate test.

(b) An applicant should indicate to the FE the checks and duties carried out, including the identification of radio facilities. Checks should be completed in accordance with the authorised checklist for the aeroplane on which the test is being taken. During pre-flight preparation for the test the applicant should be required to determine power settings and speeds. Performance data for take-off, approach and landing should be calculated by the applicant in compliance with the operations manual or flight manual for the aeroplane used.

FLIGHT TEST TOLERANCE

(c) The applicant should demonstrate the ability to:

(1) operate the aeroplane within its limitations;

(2) complete all manoeuvres with smoothness and accuracy;

(3) exercise good judgment and airmanship;

(4) apply aeronautical knowledge;

(5) maintain control of the aeroplane at all times in such a manner that the successful outcome of a procedure or manoeuvre is never seriously in doubt.

(d) The following limits are for general guidance. The FE should make allowance for turbulent conditions and the handling qualities and performance of the aeroplane used:

(1) height:

(i)	normal flight	± 150 ft
(ii)	with simulated engine failure	± 200 ft (if ME aeroplane is used)

(2) heading or tracking of radio aids:

(i)	normal flight	± 10 °
(ii)	with simulated engine failure	± 15 ° (if ME aeroplane is used)

(3) speed:

(i)	take-off and approach	+15/–5 knots
(ii)	all other flight regimes	± 15 knots

CONTENT OF THE SKILL TEST

(e) The skill test contents and sections set out in this AMC should be used for the skill test for the issue of a PPL(A) on SE and ME aeroplanes or on TMGs.

SECTION 1 PRE-FLIGHT OPERATIONS AND DEPARTURE	
Use of checklist, airmanship, control of aeroplane by external visual reference, anti/de-icing procedures, etc. apply in all sections.	
a	Pre-flight documentation, NOTAM and weather briefing
b	Mass and balance and performance calculation
c	Aeroplane inspection and servicing
d	Engine starting and after starting procedures
e	Taxiing and aerodrome procedures, pre-take-off procedures
f	Take-off and after take-off checks
g	Aerodrome departure procedures
h	ATC compliance and R/T procedures
SECTION 2 GENERAL AIRWORK	
ATC compliance and R/T procedures	
Straight and level flight, with speed changes	

Climbing: i. best rate of climb; ii. climbing turns; iii. levelling off.
Medium (30 ° bank) turns
Steep (45 ° bank) turns (including recognition and recovery from a spiral dive)
Flight at critically low air speed with and without flaps
Stalling: i. clean stall and recover with power; ii. approach to stall descending turn with bank angle 20°, approach configuration; iii. approach to stall in landing configuration.
Descending: i. with and without power; ii. descending turns (steep gliding turns); iii. levelling off.
SECTION 3 EN-ROUTE PROCEDURES
Flight plan, dead reckoning and map reading
Maintenance of altitude, heading and speed
Orientation, timing and revision of ETAs and log keeping
Diversion to alternate aerodrome (planning and implementation)
Use of radio navigation aids
Basic instrument flying check (180 ° turn in simulated IMC)
Flight management (checks, fuel systems and carburettor icing, etc.)
ATC compliance and R/T procedures
SECTION 4 APPROACH AND LANDING PROCEDURES
Aerodrome arrival procedures
* Precision landing (short field landing), crosswind, if suitable conditions available
* Flapless landing
* Approach to landing with idle power (SE only)
Touch and go
Go-around from low height
ATC compliance and R/T procedures

Actions after flight	
SECTION 5 ABNORMAL AND EMERGENCY PROCEDURES	
This section may be combined with sections 1 through 4	
Simulated engine failure after take-off (SE only)	
* Simulated forced landing (SE only)	
Simulated precautionary landing (SE only)	
Simulated emergencies	
Oral questions	
SECTION 6 SIMULATED ASYMMETRIC FLIGHT AND RELEVANT CLASS OR TYPE ITEMS	
This section may be combined with sections 1 through 5	
a	Simulated engine failure during take-off (at a safe altitude unless carried out in an FFS)
b	Asymmetric approach and go-around
c	Asymmetric approach and full stop landing
d	Engine shutdown and restart
e	ATC compliance, R/T procedures or airmanship
f	As determined by the FE: any relevant items of the class or type rating skill test to include, if applicable: i. aeroplane systems including handling of auto pilot; ii. operation of pressurisation system; iii. use of de-icing and anti-icing system.
g	Oral questions

* These items may be combined, at the discretion of the FE.

AMC2 FCL.235 - Skill test

CONTENTS OF THE SKILL TEST FOR THE ISSUE OF A PPL(H)

(a) The area and route to be flown should be chosen by the FE and all low level and hover work should be at an adequate aerodrome or site. Routes used for section 3 may end at the aerodrome of departure or at another aerodrome. The applicant should be responsible for the flight planning and should ensure that all equipment and documentation for the execution of the flight are on board. The navigation section of the test, as set out in this AMC should consist of at least three legs, each leg of a minimum duration of 10 minutes. The skill test may be conducted in two flights.

(b) An applicant should indicate to the FE the checks and duties carried out, including the identification of radio facilities. Checks should be completed in accordance with the authorised checklist or pilot operating handbook for the helicopter on which the test is being taken. During pre-flight preparation for the test the applicant is required to determine power settings and speeds. Performance data for take-off, approach and landing should be calculated by the applicant in compliance with the operations manual or flight manual for the helicopter used.

FLIGHT TEST TOLERANCE

(c) The applicant should demonstrate the ability to:

(1) operate the helicopter within its limitations;

(2) complete all manoeuvres with smoothness and accuracy;

(3) exercise good judgement and airmanship;

(4) apply aeronautical knowledge;

(5) maintain control of the helicopter at all times in such a manner that the successful outcome of a procedure or manoeuvre is never seriously in doubt.

(d) The following limits are for general guidance. The FE should make allowance for turbulent conditions and the handling qualities and performance of the helicopter used.

(1) height:

(i)	normal forward flight	± 150 ft
(ii)	with simulated major emergency	± 200 ft
(iii)	hovering IGE flight	± 2 ft

(2) heading or tracking of radio aids:

(i)	normal flight	± 10 °
(ii)	with simulated major emergency	± 15 °

(3) speed:

(i)	take-off approach	– 10 knots/+15 knots
(ii)	all other flight regimes	± 15 knots

(4) ground drift:

(i)	take-off hover IGE	± 3 ft
(ii)	landing	no sideways or backwards movement

CONTENT OF THE SKILL TEST

(e) The skill test contents and sections set out in this AMC should be used for the skill test for the issue of a PPL(H) on SE or ME helicopters.

SECTION 1 PRE-FLIGHT OR POST-FLIGHT CHECKS AND PROCEDURES	
Use of checklist, airmanship, control of helicopter by external visual reference, anti-icing procedures, etc. apply in all sections	
a	Helicopter knowledge, (for example technical log, fuel, mass and balance, performance), flight planning, NOTAM and weather briefing
b	Pre-flight inspection or action, location of parts and purpose
c	Cockpit inspection and starting procedure
d	Communication and navigation equipment checks, selecting and setting frequencies
e	Pre-take-off procedure, R/T procedure and ATC compliance
f	Parking, shutdown and post-flight procedure
SECTION 2 HOVER MANOEUVRES, ADVANCED HANDLING AND CONFINED AREAS	
a	Take-off and landing (lift-off and touch down)
b	Taxi and hover taxi
c	Stationary hover with head, cross or tail wind
d	Stationary hover turns, 360 ° left and right (spot turns)
e	Forward, sideways and backwards hover manoeuvring
f	Simulated engine failure from the hover
g	Quick stops into and downwind
h	Sloping ground or unprepared sites landings and take-offs
i	Take-offs (various profiles)
j	Crosswind and downwind take-off (if practicable)
k	Take-off at maximum take-off mass (actual or simulated)
l	Approaches (various profiles)
m	Limited power take-off and landing
n	Autorotations, (FE to select two items from: basic, range, low speed and 360 ° turns)
o	Autorotative landing
p	Practice forced landing with power recovery

q	Power checks, reconnaissance technique, approach and departure technique
SECTION 3 NAVIGATION - EN ROUTE PROCEDURES	
a	Navigation and orientation at various altitudes or heights and map reading
b	Altitude or height, speed, heading control, observation of airspace and altimeter setting
c	Monitoring of flight progress, flight log, fuel usage, endurance, ETA, assessment of track error and re-establishment of correct track and instrument monitoring
d	Observation of weather conditions and diversion planning
e	Use of navigation aids (where available)
f	ATC liaison with due observance of regulations, etc.
SECTION 4 FLIGHT PROCEDURES AND MANOEUVRES	
a	Level flight, control of heading, altitude or height and speed
b	Climbing and descending turns to specified headings
c	Level turns with up to 30 ° bank, 180 ° to 360 ° left and right
d	Level turns 180 ° left and right by sole reference to instruments
SECTION 5 ABNORMAL AND EMERGENCY PROCEDURES (SIMULATED WHERE APPROPRIATE)	
Note (1) Where the test is conducted on an ME helicopter, a simulated engine failure drill, including an SE approach and landing should be included in the test.	
Note (2) The FE should select four items from the following:	
a	Engine malfunctions, including governor failure, carburettor or engine icing and oil system, as appropriate
b	Fuel system malfunction
c	Electrical system malfunction
d	Hydraulic system malfunction, including approach and landing without hydraulics, as applicable
e	Main rotor or anti-torque system malfunction (FFS or discussion only)
f	Fire drills, including smoke control and removal, as applicable
g	Other abnormal and emergency procedures as outlined in an appropriate flight manual and with reference to Appendix 9 C to Part-FCL, sections 3 and 4, including for ME helicopters: (a) Simulated engine failure at take-off: (1) rejected take-off at or before TDP or safe forced landing at or before DPATO; (2) shortly after TDP or DPATO. (b) Landing with simulated engine failure: (1) landing or go-around following engine failure before LDP or DPBL;

	(2) following engine failure after LDP or safe forced landing after DPBL.

AMC3 FCL.235 - Skill test

CONTENT OF THE SKILL TEST FOR THE ISSUE OF THE PPL(AS)

(a) The area and route to be flown is chosen by the FE. Routes used for section 3 may end at the aerodrome of departure or at another aerodrome and one destination should be a controlled aerodrome. The skill test may be conducted in two flights. The total duration of the flight(s) should be at least 60 minutes.

(b) The applicant should demonstrate the ability to:

(1) operate the airship within its limitations;

(2) complete all manoeuvres with smoothness and accuracy;

(3) exercise good judgement and airmanship;

(4) apply aeronautical knowledge;

(5) maintain control of the airship at all times in such a manner that the successful outcome of a procedure or manoeuvre is never seriously in doubt.

FLIGHT TEST TOLERANCES

(c) The following limits should apply, corrected to make allowance for turbulent conditions and the handling qualities and performance of the airship used.

(1) height:

(i) normal flight ±200 ft

(ii) simulated major emergency ±300 ft

(2) tracking on radio aids: ±15 °

(3) heading:

(i) normal flight ±15 °

(ii) simulated major emergency ±20 °

CONTENT OF THE TEST

(d) The skill test contents and sections set out in this AMC should be used for the skill test for the issue of a PPL(As).

(e) Items in sections 5 and 6 may be performed in an FNPT (As) or a FS (As).

SECTION 1 PRE-FLIGHT OPERATIONS AND DEPARTURE	
Use of airship checklists, airmanship, control of airship by external visual reference, anti-icing procedures, and principles of threat and error management, etc. apply in all sections	
a	Pre-flight, including: flight planning, documentation, mass and balance, NOTAM and weather briefing
b	Airship inspection and servicing
c	Off-mast procedure, ground manoeuvring and take-off
d	Performance considerations and trim

e	Aerodrome and traffic pattern operations
f	Departure procedure, altimeter setting, collision avoidance (look-out)
g	ATC compliance and R/T procedures
SECTION 2 GENERAL AIRWORK	
a	Control of the airship by external visual reference, including straight and level, climb, descent and look-out
b	Flight close to pressure height
c	Turns
d	Steep descents and climbs
e	Flight by reference solely to instruments, including: i. Level flight, control of heading, altitude and air speed; ii. Climbing and descending turns; iii. Recoveries from unusual attitudes.
f	ATC compliance and R/T procedures
SECTION 3 EN-ROUTE PROCEDURES	
a	Flight plan, dead reckoning and map reading
b	Maintenance of altitude, heading and speed and collision avoidance (look-out procedures)
c	Orientation, timing and revision of ETAs and log keeping
d	Observation of weather conditions and diversion to alternate aerodrome (planning and implementation)
e	Use of radio navigation aids
f	Flight management (checks, fuel systems, etc.)
g	ATC compliance and R/T procedures
SECTION 4 APPROACH AND LANDING PROCEDURES	
a	Aerodrome arrival procedures, altimeter setting, checks and look-out
b	ATC compliance and R/T procedures
c	Go-around action
d	Normal landing
e	Short field landing
f	Post-flight actions
SECTION 5 ABNORMAL AND EMERGENCY PROCEDURES	
This section may be combined with sections 1 through 4	

a	Simulated engine failure after take-off (at a safe altitude) and fire drill
b	Equipment malfunctions
c	Forced landing (simulated)
d	ATC compliance and R/T procedures
e	Oral questions
SECTION 6 RELEVANT TYPE ITEMS	
This section may be combined with sections 1 through 5	
a	Simulated engine failure during take-off (at a safe altitude unless carried out in a FFS)
b	Approach and go-around with failed engine(s)
c	Approach and full stop landing with failed engine(s)
d	Malfunctions in the envelope pressure system
e	ATC compliance, R/T procedures and airmanship
f	As determined by the FE: any relevant items of the type rating skill test to include, if applicable: i. Airship systems; ii. Operation of envelope pressure system.
g	Oral questions

AMCs and GM to SECTION 2 - Specific requirements for the PPL aeroplanes – PPL(A)

Reserved

AMCs and GM to SECTION 3 - Specific requirements for the PPL helicopters – PPL(H)

Reserved

AMCs and GM to SECTION 4 - Specific requirements for the PPL Airships – PPL(As)

AMC1 FCL.210.As PPL(As) - Experience requirements and crediting

FLIGHT INSTRUCTION FOR THE PPL(AS)

(a) Entry to training

Before being accepted for training an applicant should be informed that the appropriate medical certificate must be obtained before solo flying is permitted.

(b) Flight instruction

(1) The PPL(As) flight instruction syllabus should take into account the principles of threat and error management and cover:

(i) pre-flight operations, including mass and balance determination, airship inspection and servicing;

(ii) ground manoeuvring, masting and unmasting procedures;

(iii) aerodrome and traffic pattern operations, collision avoidance precautions and procedures;

(iv) control of the airship by external visual reference;

(v) take-offs and landings;

(vi) flight by reference solely to instruments, including the completion of a level 180 ° turn;

(vii) cross-country flying using visual reference, dead reckoning and radio navigation aids;

(viii) emergency operations, including simulated airship equipment malfunctions;

(ix) operations to, from and transiting controlled aerodromes, compliance with air traffic services procedures, communication procedures and phraseology.

(2) Before allowing the applicant for a PPL(As) to undertake his/her first solo flight, the FI should ensure that the applicant can use R/T communication.

(c) Syllabus of flight instruction

(1) The numbering of exercises should be used primarily as an exercise reference list and as a broad instructional sequencing guide; therefore the demonstrations and practices need not necessarily be given in the order listed. The actual order and content will depend upon the following interrelated factors:

(i) the applicant's progress and ability;

(ii) the weather conditions affecting the flight;

(iii) the flight time available;

(iv) instructional technique considerations;

(v) the local operating environment;

(vi) applicability of the exercises to the airship.

(2) Each of the exercises involves the need for the applicant to be aware of the needs of good airmanship and look-out, which should be emphasised at all times.

(i) Exercise 1a: Familiarisation with the airship:

(A) characteristics of the airship;

(B) cockpit layout;

(C) systems;

(D) checklists, drills and controls.

(ii) Exercise 1b: Emergency drills:

(A) action if fire on the ground and in the air;

(B) engine cabin and electrical system fire;

(C) systems failure;

(D) escape drills, location and use of emergency equipment and exits.

(iii) Exercise 2: Preparation for and action after flight:

(A) light authorisation and airship acceptance;

(B) serviceability documents;

(C) equipment required, maps, etc.;

(D) mass and balance;

(E) external checks;

(F) ground crew briefing;

(G) internal checks;

(H) harness, seat or rudder panel adjustments;

(I) starting and warm-up checks;

(J) power checks;

(K) running down system checks and switching off the engine;

(L) parking, security and masting;

(M) completion of authorisation sheet and serviceability documents.

(iv) Exercise 3: Air experience: flight exercise.

(v) Exercise 4: Effects of controls:

(A) primary effects;

(B) further effects;

(C) effects of:

(a) air speed;

(b) power;

(c) trimming controls;

(d) other controls, as applicable.

(D) operation of:

(a) mixture control;

(b) carburettor heat;

(C) cabin heating or ventilation.

(vi) Exercise 5: Ground manoeuvring:

(A) pre-taxi checks;

(B) starting, control of speed and stopping;

(C) engine handling;

(D) masting procedures;

(E) control of direction and turning;

(F) effects of wind;

(G) effects of ground surface;

(H) marshalling signals;

(I) instrument checks;

(J) air traffic control procedures;

(K) emergencies.

(vii) Exercise 6a: Take-off procedures:

(A) pre-take-off checks;

(B) take-off with different static heaviness;

(C) drills during and after take-off;

(D) noise abatement procedures.

(viii) Exercise 6b: Emergencies:

(A) abandoned take-off;

(B) engine failure after take-off;

(C) malfunctions of thrust vector control;

(D) aerodynamic control failures;

(E) electrical and system failures.

(ix) Exercise 7: Climbing:

(A) entry, maintaining the normal and max rate climb and levelling off;

(B) levelling off at selected altitudes;

(C) maximum angle of climb;

(D) maximum rate of climb.

(x) Exercise 8: Straight and level:

(A) attaining and maintaining straight and level flight;

(B) flight at or close to pressure height;

(C) control in pitch, including use of trim;

(D) at selected air speeds (use of power);

(E) during speed changes;

(F) use of instruments for precision.

(xi) Exercise 9: Descending:

(A) entry, maintaining and levelling off;

(B) levelling off at selected altitudes;

(C) maximum rate of descent;

(D) maximum angle of descent;

(E) use of instruments for precision flight.

(xii) Exercise 10: Turning:

(A) entry and maintaining level turns;

(B) resuming straight flight;

(C) faults in the turn;

(D) climbing turns;

(E) descending turns;

(F) turns onto selected headings, use of gyro heading indicator and compass;

(G) use of instruments for precision.

(xiii) Exercise 11: Hovering: hovering manoeuvres (as applicable);

(xiv) Exercise 12a: Approach and landing:

(A) effect of wind on approach and touchdown speeds;

(B) landing with different static heaviness;

(C) missed approach and go-around procedures;

(D) noise abatement procedures.

(xv) Exercise 12b: Emergencies:

(A) aborted approach or go-around;

(B) malfunction of thrust vector control;

(C) envelope emergencies;

(D) fire emergencies;

(E) aerodynamic control failures;

(F) electrical and system failures.

(xvi) Exercise 13: Precautionary landing:

(A) occasions necessitating;

(B) in-flight conditions;

(C) landing area selection;

(D) circuit and approach;

(E) actions after landing;

(xvii) Exercise 14a: Navigation:

(A) flight planning:

(a) weather forecast and actuals;

(b) map selection and preparation:

(1) choice of route;

(2) airspace structure;

(3) sensitive areas;

(4) safety altitudes.

(c) calculations:

(1) magnetic heading(s) and time(s) en-route;

(2) fuel consumption;

(3) mass and balance;

(4) performance.

(d) flight information:

(1) NOTAMs etc.;

(2) radio frequencies;

(3) selection of alternate aerodromes.

(e) airship documentation;

(f) notification of the flight:

(1) pre-flight administrative procedures;

(2) flight plan form.

(B) departure:

(a) organisation of cockpit workload;

(b) departure procedures:

(1) altimeter settings;

(2) ATC liaison in controlled or regulated airspace;

(3) setting heading procedure;

(4) noting of ETAs.

(c) maintenance of altitude and heading;

(d) revisions of ETA and heading;

(e) log keeping;

(f) use of radio;

(g) use of navaids;

(h) minimum weather conditions for continuation of flight;

(i) in-flight decisions;

(j) transiting controlled or regulated airspace;

(k) diversion procedures;

(l) uncertainty of position procedure;

(m) lost procedure.

(C) arrival, aerodrome joining procedure:

(a) ATC liaison in controlled or regulated airspace;

(b) altimeter setting;

(c) entering the traffic pattern;

(d) circuit procedures;

(e) parking or on masting;

(f) security of airship;

(g) refuelling;

(h) closing of flight plan, if appropriate;

(i) post-flight administrative procedures.

(xviii) Exercise 14b: Navigation problems at lower levels and in reduced visibility:

(A) actions before descending;

(B) hazards (for example obstacles, and terrain);

(C) difficulties of map reading;

(D) effects of winds, turbulence and precipitation;

(E) vertical situational awareness;

(F) avoidance of noise sensitive areas;

(G) joining the circuit;

(H) bad weather circuit and landing.

(xix) Exercise 14c: Radio navigation:

(A) use of GNSS

(a) selection of waypoints;

(b) to or from indications and orientation;

(c) error messages.

(B) use of VHF omni range (if applicable):

(a) availability, AIP and frequencies;

(b) selection and identification;

(c) OBS;

(d) to or from indications and orientation;

(e) CDI;

(f) determination of radial;

(g) intercepting and maintaining a radial;

(h) VOR passage;

(i) obtaining a fix from two VORs.

(C) use of ADF equipment: NDBs (if applicable):

(a) availability, AIP and frequencies;

(b) selection and identification;

(c) orientation relative to the beacon;

(d) homing.

(D) use of VHF/DF:

(a) availability, AIP and frequencies;

(b) R/T procedures and ATC liaison;

(c) obtaining a QDM and homing.

(E) use of en-route or terminal radar:

(a) availability and AIP;

(b) procedures and ATC liaison;

(c) pilot's responsibilities;

(d) secondary surveillance radar:

(1) transponders;

(2) code selection;

(3) interrogation and reply.

(F) use of DME (if applicable);

(a) station selection and identification;

(b) modes of operation: distance, groundspeed and time to run.

(xx) Exercise 15: Basic instrument flight:

(A) physiological sensations;

(B) instrument appreciation: attitude instrument flight;

(C) instrument limitations;

(D) basic manoeuvres:

(a) straight and level;

(b) climbing and descending;

(c) turns, climbing and descending, onto selected headings;

(d) recoveries from climbing and descending turns.

(d) BITD

(1) A BITD may be used for flight training for:

(i) flight by reference solely to instruments;

(ii) navigation using radio navigation aids;

(iii) basic instrument flight.

(2) The use of the BITD should be subject to the following:

(i) the training should be complemented by exercises on an airship;

(ii) the record of the parameters of the flight must be available; and an FI(As) should conduct the instruction.

AMCs and GM to SECTION 5 - Specific requirements for the Glider pilot license – GPL

AMC1 FCL.135.S; FCL.205.S (a)

EXTENSION OF PRIVILEGES TO TMG: LAPL(G) AND GPL

(a) The aim of the flight training is to qualify LAPL(G) or GPL holders to exercise the privileges of the licence on a TMG.

(b) The ATO should issue a certificate of satisfactory completion of the training.

(c) Theoretical knowledge

The theoretical knowledge syllabus should cover the revision or explanation of:

(1) Principles of flight:

(i) operating limitations (addition TMG);

(ii) propellers;

(iii) flight mechanics.

(2) Operational procedures for TMG:

(i) special operational procedures and hazards;

(ii) emergency procedures.

(3) Flight performance and planning:

(i) mass and balance considerations;

(ii) loading;

(iii) CG calculation;

(iv) load and trim sheet;

(v) performance of TMGs;

(vi) flight planning for VFR flights;

(vii) fuel planning;

(viii) pre-flight preparation;

(ix) ICAO flight plan;

(x) flight monitoring and in-flight re-planning.

(4) Aircraft general knowledge:

(i) system designs, loads, stresses, maintenance;

(ii) airframe;

(iii) landing gear, wheels, tyres, brakes;

(iv) fuel system;

(v) electrics;

(vi) piston engines;

(vii) propellers;

(viii) instrument and indication systems.

(5) Navigation:

(i) dead reckoning navigation (addition powered flying elements);

(ii) in-flight navigation (addition powered flying elements);

(iii) basic radio propagation theory;

(iv) radio aids (basics);

(v) radar (basics);

(vi) GNSS.

(d) Flight instruction

(1) The numbering of exercises should be used primarily as an exercise reference list and as a broad instructional sequencing guide; therefore the demonstrations and practices need not necessarily be given in the order listed.

(2) The flying exercises should cover the revision or explanation of the following exercises:

(i) Exercise 1: Familiarisation with the TMG:

(A) characteristics of the TMG;

(B) cockpit layout;

(C) systems;

(D) checklists, drills and controls.

(ii) Exercise 1e: Emergency drills:

(A) action if fire on the ground and in the air;

(B) engine cabin and electrical system fire;

(C) systems failure;

(D) escape drills, location and use of emergency equipment and exits.

(iii) Exercise 2: Preparation for and action after flight:

(A) serviceability documents;

(B) equipment required, maps, etc.;

(C) external checks;

(D) internal checks;

(E) harness and seat or rudder panel adjustments;

(F) starting and warm-up checks;

(G) power checks;

(H) running down system checks and switching off the engine;

(I) parking, security and picketing (for example tie down);

(J) completion of authorisation sheet and serviceability documents.

(iv) Exercise 3: Taxiing:

(A) pre-taxi checks;

(B) starting, control of speed and stopping;

(C) engine handling;

(D) control of direction and turning;

(E) turning in confined spaces;

(F) parking area procedure and precautions;

(G) effects of wind and use of flying controls;

(H) effects of ground surface;

(I) freedom of rudder movement;

(J) marshalling signals;

(K) instrument checks;

(L) air traffic control procedures (if applicable).

(v) Exercise 3e: Emergencies: brake and steering failure.

(vi) Exercise 4: Straight and level:

(A) at normal cruising power, attaining and maintaining straight and level flight;

(B) flight at critically high air speeds;

(C) demonstration of inherent stability;

(D) control in pitch, including use of trim;

(E) lateral level, direction and balance and trim;

(F) at selected air speeds (use of power);

(G) during speed and configuration changes;

(H) use of instruments for precision.

(vii) Exercise 5: Climbing:

(A) entry, maintaining the normal and max rate climb and levelling off;

(B) levelling off at selected altitudes;

(C) en-route climb (cruise climb);

(D) climbing with flap down;

(E) recovery to normal climb;

(F) maximum angle of climb;

(G) use of instruments for precision.

(viii) Exercise 6: Descending:

(A) entry, maintaining and levelling off;

(B) levelling off at selected altitudes;

(C) glide, powered and cruise descent (including effect of power and air speed);

(D) side slipping (on suitable types);

(E) use of instruments for precision flight.

(ix) Exercise 7: Turning:

(A) entry and maintaining medium level turns;

(B) resuming straight flight;

(C) faults in the turn (incorrect pitch, bank and balance);

(D) climbing turns;

(E) descending turns;

(F) slipping turns (on suitable types);

(G) turns onto selected headings, use of gyro heading indicator or compass;

(H) use of instruments for precision.

(x) Exercise 8a: Slow flight:

Note: the objective is to improve the pilot's ability to recognise inadvertent flight at critically low speeds and provide practice in maintaining the TMG in balance while returning to normal air speed.

(A) safety checks;

(B) introduction to slow flight;

(C) controlled flight down to critically slow air speed;

(D) application of full power with correct attitude and balance to achieve normal climb speed.

(xi) Exercise 8b: Stalling:

(A) airmanship;

(B) safety checks;

(C) symptoms;

(D) recognition;

(E) clean stall and recovery without power and with power;

(F) recovery when a wing drops;

(G) approach to stall in the approach and in the landing configurations, with and without power, recovery at the incipient stage.

(xii) Exercise 9: Take-off and climb to downwind position:

(A) pre-take-off checks;

(B) into wind take-off;

(C) safeguarding the nose wheel (if applicable);

(D) crosswind take-off;

(E) drills during and after take-off;

(F) short take-off and soft field procedure or techniques including performance calculations;

(G) noise abatement procedures.

(xiii) Exercise 10: Circuit, approach and landing:

(A) circuit procedures, downwind and base leg;

(B) powered approach and landing;

(C) safeguarding the nose wheel (if applicable);

(D) effect of wind on approach and touchdown speeds;

(E) use of airbrakes, flaps, slats or spoilers;

(F) crosswind approach and landing;

(G) glide approach and landing (engine stopped);

(H) short landing and soft field procedures or techniques;

(I) flapless approach and landing (if applicable);

(J) wheel landing (tail wheel aeroplanes);

(K) missed approach and go-around;

(L) noise abatement procedures.

(xiv) Exercise 9/10e: Emergencies:

(A) abandoned take-off;

(B) engine failure after take-off;

(C) mislanding and go-around;

(D) missed approach.

Note: in the interests of safety it will be necessary for pilots trained on nose wheel TMGs to undergo dual conversion training before flying tail wheel TMGs, and vice versa.

(xv) Exercise 11: Advanced turning:

(A) steep turns (45 °), level and descending;

(B) stalling in the turn and recovery;

(C) recoveries from unusual attitudes, including spiral dives.

(xvi) Exercise 12: Stopping and restarting the engine:

(A) engine cooling procedures;

(B) switching off procedure in-flight;

(C) glider operating procedures;

(D) restarting procedure.

(xvii) Exercise 13: Forced landing without power:

(A) forced landing procedure;

(B) choice of landing area, provision for change of plan;

(C) gliding distance;

(D) descent plan;

(E) key positions;

(F) engine failure checks;

(G) use of radio;

(H) base leg;

(I) final approach;

(J) landing;

(K) actions after landing.

(xviii) Exercise 14: Precautionary landing:

(A) full procedure away from aerodrome to break-off height;

(B) occasions necessitating;

(C) in-flight conditions;

(D) landing area selection:

(a) normal aerodrome;

(b) disused aerodrome;

(c) ordinary field.

(E) circuit and approach;

(F) actions after landing.

(xix) Exercise 15a: Navigation

(A) Flight planning

(a) weather forecast and actuals;

(b) map selection and preparation:

(1) choice of route;

(2) airspace structure;

(3) safety altitudes.

(c) calculations:

(1) magnetic heading(s) and time(s) en-route;

(2) fuel consumption;

(3) mass and balance;

(4) mass and performance.

(d) flight information:

(1) NOTAMs, etc.;

(2) radio frequencies;

(3) selection of alternate aerodromes.

(e) TMG documentation;

(f) notification of the flight:

(1) pre-flight administrative procedures;

(2) flight plan form.

(B) Departure:

(a) organisation of cockpit workload;

(b) departure procedures:

(1) altimeter settings;

(2) ATC liaison in regulated airspace;

(3) setting heading procedure;

(4) noting of ETAs.

(C) En-route:

(a) maintenance of altitude and heading;

(b) revisions of ETA and heading;

(c) log keeping;

(d) use of radio or compliance with ATC procedures;

(e) minimum weather conditions for continuation of flight;

(f) in-flight decisions;

(g) transiting controlled or regulated airspace;

(h) diversion procedures;

(i) uncertainty of position procedure;

(j) lost procedure.

(D) Arrival, aerodrome joining procedure:

(a) ATC liaison in regulated airspace;

(b) altimeter setting;

(c) entering the traffic pattern;

(d) circuit procedures;

(e) parking;

(f) security of TMG;

(g) refuelling;

(h) closing of flight plan, if appropriate;

(i) post-flight administrative procedures.

(xx) Exercise 15b: Navigation problems at lower levels and in reduced visibility:

(A) actions before descending;

(B) hazards (for example obstacles and terrain);

(C) difficulties of map reading;

(D) effects of wind and turbulence;

(E) vertical situational awareness (avoidance of controlled flight into terrain);

(F) avoidance of noise sensitive areas;

(G) joining the circuit;

(H) bad weather circuit and landing.

(xxi) Exercise 15c: Radio navigation (basics):

(A) Use of GNSS or VOR/NDB;

(a) selection of waypoints;

(b) to or from indications or orientation;

(c) error messages.

(B) Use of VHF/DF:

(a) availability, AIP and frequencies;

(b) R/T procedures and ATC liaison;

(c) obtaining a QDM and homing.

(C) Use of en-route or terminal radar:

(a) availability and AIP;

(b) procedures and ATC liaison;

(c) pilot's responsibilities;

(d) secondary surveillance radar;

(1) transponders;

(2) code selection;

(3) interrogation and reply.

AMC1 FCL.205.S(b) GPL - Privileges and conditions

CONTENTS OF THE PROFICIENCY CHECK FOR THE EXTENSION OF GPL PRIVILEGES TO EXERCISE COMMERCIAL PRIVILEGES ON A GLIDER

(a) The applicant should be responsible for the flight planning and should ensure that all equipment and documentation for the execution of the flight are on board.

(b) An applicant should indicate to the FE the checks and duties carried out. Checks should be completed in accordance with the authorised checklist for the glider on which the test is being taken.

FLIGHT TEST TOLERANCE

(c) The applicant should demonstrate the ability to:

(1) operate the glider within its limitations;

(2) complete all manoeuvres with smoothness and accuracy;

(3) exercise good judgment and airmanship;

(4) apply aeronautical knowledge;

(5) maintain control of the glider at all times in such a manner that the successful outcome of a procedure or manoeuvre is never seriously in doubt.

CONTENT OF THE SKILL TEST

(d) The applicant should demonstrate his/her skill in at least the winch or aerotow method of launching.

SECTION 1 PRE-FLIGHT OPERATIONS AND TAKE-OFF	
Use of checklist, airmanship, control of glider by external visual reference, look-out procedures, etc. apply in all sections.	
a	Pre-flight glider (daily) inspection, documentation, NOTAM and weather briefing
b	Verifying in-limits mass and balance and performance calculation
c	Passenger briefing
d	Glider servicing compliance
e	Pre-take-off checks
SECTION 2 LAUNCH METHOD Note: at least for one of the three launch methods all the mentioned items are fully exercised during the skill test.	
SECTION 2 (a) WINCH OR CAR LAUNCH	
a	Signals before and during launch, including messages to winch driver
b	Initial roll and take-off climb
c	Adequate profile of winch launch
d	Launch failures (simulated)
e	Situational awareness
SECTION 2 (b) AEROTOW LAUNCH	
a	Signals before and during launch, including signals to or communications with tow plane pilot for any problems
b	Initial roll and take-off climb
c	Launch abandonment (simulation only or 'talk-through')
d	Correct positioning during straight flight and turns
e	Out of position and recovery
f	Correct release from tow
g	Lookout and airmanship through whole launch phase
SECTION 2 (c) SELF LAUNCH (TMGs excluded)	

a	ATC compliance
b	Aerodrome departure procedures
c	Initial roll and take-off climb
d	Simulated engine failure after take-off
e	Engine shut down and stowage
f	Lookout and airmanship through whole launch phase
SECTION 3 GENERAL AIRWORK	
a	Maintain straight flight: attitude and speed control
b	Steep (45 ° bank) turns, look-out procedures and collision avoidance
c	Turning on to selected headings visually and with use of compass
d	Flight at high angle of attack (critically low air speed)
e	Clean stall and recovery
f	Spin avoidance and recovery
g	Local area navigation and awareness
SECTION 4 CIRCUIT, APPROACH AND LANDING	
a	Aerodrome circuit joining procedure
b	Collision avoidance: look-out procedures
c	Pre-landing checks
d	Circuit, approach control and landing
e	Precision landing (simulation of out-landing: short field)
f	Cross wind landing if suitable conditions available

AMC1 FCL.110.S; FCL.210.S

FLIGHT INSTRUCTION FOR THE LAPL(G) AND THE GPL

(a) Entry to training

Before being accepted for training an applicant should be informed that the appropriate medical certificate must be obtained before solo flying is permitted.

(b) Flight instruction

(1) The LAPL (G) and GPL flight instruction syllabus should take into account the principles of threat and error management and also cover:

(i) pre-flight operations, including verifying mass and balance, aircraft inspection and servicing, airspace and weather briefing;

(ii) aerodrome and traffic pattern operations, collision avoidance precautions and procedures;

(iii) control of the aircraft by external visual reference;

(iv) flight at high angle of attack (critically low air speeds), recognition of, and recovery from, incipient and full stalls and spins;

(v) flight at critically high air speeds, recognition of, and recovery from spiral dive;

(vi) normal and crosswind take-offs in respect with the different launch methods;

(vii) normal and crosswind landings;

(viii) short field landings and outlandings: field selection, circuit and landing hazards and precautions;

(ix) cross-country flying using visual reference, dead reckoning and available navigation aids;

(x) soaring techniques as appropriate to site conditions;

(xi) emergency actions;

(xii) compliance with air traffic services procedures and communication procedures.

(2) Before allowing the applicant to undertake his/her first solo flight, the FI should ensure that the applicant can operate the required systems and equipment.

(c) Syllabus of flight instruction

(1) The numbering of exercises should be used primarily as an exercise reference list and as a broad instructional sequencing guide; therefore the demonstrations and practices need not necessarily be given in the order listed. The actual order and content will depend upon the following interrelated factors:

(i) the applicant's progress and ability;

(ii) the weather conditions affecting the flight;

(iii) the flight time available;

(iv) instructional technique considerations;

(v) the local operating environment;

(vi) applicability of the exercises to the glider type.

(2) At the discretion of the instructors some of the exercises may be combined and some other exercises may be done in several flights.

(3) At least the exercises 1 to 12 have to be completed before the first solo flight.

(4) Each of the exercises involves the need for the applicant to be aware of the needs for good airmanship and look-out, which should be emphasised at all times.

(i) Exercise 1: Familiarisation with the glider:

(A) characteristics of the glider;

(B) cockpit layout: instruments and equipment;

(C) light controls: stick, pedals, airbrakes, flaps and trim;

(D) cable release and undercarriage;

(E) checklists, drills and controls.

(ii) Exercise 2: Procedures if emergencies:

(A) use of safety equipment (parachute);

(B) action if system failures;

(C) bail-out procedures.

(iii) Exercise 3: Preparation for flight:

(A) pre-flight briefings;

(B) required documents on board;

(C) equipment required for the intended flight;

(D) ground handling, movements, tow out, parking and security;

(E) pre-flight external and internal checks;

(F) verifying in-limits mass and balance;

(G) harness, seat or rudder panel adjustments;

(H) passenger handling;

(I) pre-launch checks.

(iv) Exercise 4: Initial air experience:

(A) area familiarisation;

(B) look-out procedures.

(v) Exercise 5: Effects of controls:

(A) look-out procedures;

(B) use of visual references;

(C) primary effects when laterally level and when banked;

(D) reference attitude and effect of elevator;

(E) relationship between attitude and speed;

(F) effects of:

(a) flaps (if available);

(b) airbrakes.

(vi) Exercise 6: Coordinated rolling to and from moderate angles of bank:

(A) look-out procedures;

(B) further effects of aileron (adverse yaw) and rudder (roll);

(C) coordination;

(D) rolling to and from moderate angles of bank and return to straight flight.

(vii) Exercise 7: Straight flying:

(A) look-out procedures;

(B) maintaining straight flight;

(C) flight at critically high air speeds;

(D) demonstration of inherent pitch stability;

(E) control in pitch, including use of trim;

(F) lateral level, direction and balance and trim;

(G) air speed: instrument monitoring and control.

(viii) Exercise 8: Turning:

(A) look-out procedures;

(B) demonstration and correction of adverse yaw;

(C) entry to turn (medium level turns);

(D) stabilising turns;

(E) exiting turns;

(F) faults in the turn (slipping and skidding);

(G) turns on to selected headings and use of compass;

(H) use of instruments (ball indicator or slip string) for precision.

(ix) Exercise 9a: Slow flight:

Note: the objective is to improve the student's ability to recognise inadvertent flight at critically low speeds (high angle of attack) and to provide practice in maintaining the glider in balance while returning to normal attitude (speed).

(A) safety checks;

(B) introduction to characteristics of slow flight;

(C) controlled flight down to critically high angle of attack (slow air speed).

(x) Exercise 9b: Stalling:

(A) safety checks;

(B) pre-stall symptoms, recognition and recovery;

(C) stall symptoms, recognition and recovery;

(D) recovery when a wing drops;

(E) approach to stall in the approach and in the landing configurations;

(F) recognition and recovery from accelerated stalls.

(xi) Exercise 10: Spin recognition and spin avoidance:

(A) safety checks;

(B) stalling and recovery at the incipient spin stage (stall with excessive wing drop, about 45°);

(C) entry into fully developed spins (if suitable training aircraft available);

(D) recognition of full spins (if suitable training aircraft available);

(E) standard spin recovery (if suitable training aircraft available);

(F) instructor induced distractions during the spin entry (if suitable training aircraft available).

Note: consideration of manoeuvre limitations and the need to refer to the glider manual and mass and balance calculations. If no suitable training aircraft is available to demonstrate the fully developed spin, all the aspects related to these training items have to be covered by specific theoretical instruction.

(xii) Exercise 11: Take-off or launch methods:

At least one launch method must be taught containing all the subjects below.

(xiii) Exercise 11a: Winch launch:

(A) signals or communication before and during launch;

(B) use of the launching equipment;

(C) pre-take-off checks;

(D) into wind take-off;

(E) crosswind take-off;

(F) optimum profile of winch launch and limitations;

(G) release procedures;

(H) launch failure procedures.

(xiv) Exercise 11b: Aero tow:

(A) signals or communication before and during launch;

(B) use of the launch equipment;

(C) pre-take-off checks;

(D) into wind take-off;

(E) crosswind take-off;

(F) on tow: straight flight, turning and slip stream;

(G) out of position in tow and recovery;

(H) descending on tow (towing aircraft and glider);

(I) release procedures;

(J) launch failure and abandonment.

(xv) Exercise 11c: Self-launch:

(A) engine extending and retraction procedures;

(B) engine starting and safety precautions;

(C) pre-take-off checks;

(D) noise abatement procedures;

(E) checks during and after take-off;

(F) into wind take-off;

(G) crosswind take-off;

(H) power failures and procedures;

(I) abandoned take-off;

(J) maximum performance (short field and obstacle clearance) take-off;

(K) short take-off and soft field procedure or techniques and performance calculations.

(xvi) Exercise 11d: Car launch:

(A) signals before and during launch;

(B) use of the launch equipment;

(C) pre-take-off checks;

(D) into wind take-off;

(E) crosswind take-off;

(F) optimum launch profile and limitations;

(G) release procedures;

(H) launch failure procedures.

(xvii) Exercise 11e: Bungee launch:

(A) signals before and during launch;

(B) use of the launch equipment;

(C) pre-take-off checks;

(D) into wind take-off.

(xviii) Exercise 12: Circuit, approach and landing:

(A) procedures for re-joining the circuit;

(B) collision avoidance, look-out techniques and procedures;

(C) pre-landing checks: circuit procedures, downwind and base leg;

(D) effect of wind on approach and touchdown speeds;

(E) use of flaps (if applicable);

(F) visualisation of an aiming point;

(G) approach control and use of airbrakes;

(H) normal and crosswind approach and landing;

(I) short landing procedures or techniques.

(xix) Exercise 13: First solo:

(A) instructor's briefing including limitations;

(B) awareness of local area and restrictions;

(C) use of required equipment;

(D) observation of flight and debriefing by instructor.

(xx) Exercise 14: Advanced turning:

(A) steep turns (45°);

(B) stalling and spin avoidance in the turn and recovery;

(C) recoveries from unusual attitudes, including spiral dives.

(xxi) Exercise 15: Soaring techniques:

At least one of the three soaring techniques must be taught containing all subjects below.

(xxii) Exercise 15a: Thermalling:

(A) look-out procedures;

(B) detection and recognition of thermals;

(C) use of audio soaring instruments;

(D) joining a thermal and giving way;

(E) flying in close proximity to other gliders;

(F) centring in thermals;

(G) leaving thermals.

(xxiii) Exercise 15b: Ridge flying:

(A) look-out procedures;

(B) practical application of ridge flying rules;

(C) optimisation of flight path;

(D) speed control.

(xxiv) Exercise 15C: Wave flying:

(A) look-out procedures;

(B) wave access techniques;

(C) speed limitations with increasing height;

(D) use of oxygen.

(xxv) Exercise 16: Out-landings:

(A) gliding range;

(B) restart procedures (only for self-launching and self-sustaining gliders);

(C) selection of landing area;

(D) circuit judgement and key positions;

(E) circuit and approach procedures;

(F) actions after landing.

(xxvi) Exercise 17: Cross-country flying:

If the required cross-country flight will be conducted as a solo cross-country flight, all the subjects below must be taught before.

(xxvii) Exercise 17a: Flight planning:

(A) weather forecast and actuals;

(B) NOTAMs and airspace considerations;

(C) map selection and preparation;

(D) route planning;

(E) radio frequencies (if applicable);

(F) pre-flight administrative procedure;

(G) flight plan where required;

(H) mass and performance;

(I) alternate aerodromes and landing areas;

(J) safety altitudes.

(xxviii) Exercise 17b: In-flight navigation:

(A) maintaining track and re-routing considerations;

(B) use of radio and phraseology (if applicable);

(C) in-flight planning;

(D) procedures for transiting regulated airspace or ATC liaison where required;

(E) uncertainty of position procedure;

(F) lost procedure;

(G) use of additional equipment where required;

(H) joining, arrival and circuit procedures at remote aerodrome.

(xxix) Exercise 17c: Cross-country techniques:

(A) look-out procedures;

(B) maximising potential cross-country performance;

(C) risk reduction and threat reaction.

AMCs and GM to SECTION 6 - Specific requirements for the Balloon pilot license – BPL

AMC1 FCL.205.B(b) BPL - Privileges and conditions

CONTENTS OF THE PROFICIENCY CHECK FOR EXTENSION OF BPL PRIVILEGES TO EXERCISE COMMERCIAL PRIVILEGES ON A BALLOON

(a) The take-off site should be chosen by the applicant depending on the actual meteorological conditions, the area which has to be overflown and the possible options for suitable landing sites. The applicant should be responsible for the flight planning and should ensure that all equipment and documentation for the execution of the flight are on board. The proficiency check may be conducted in two flights. The total duration of the flight(s) should be at least 60 minutes.

(b) An applicant should indicate to the FE the checks and duties carried out. Checks should be completed in accordance with the flight manual or the authorised checklist for the balloon on which the test is being taken. During pre-flight preparation for the test the applicant should be required to perform crew and passenger briefings and demonstrate crowd control. The load calculation should be performed by the applicant in compliance with the operations manual or flight manual for the balloon used.

FLIGHT TEST TOLERANCE

(c) The applicant should demonstrate the ability to:

(1) operate the balloon within its limitations;

(2) complete all manoeuvres with smoothness and accuracy;

(3) exercise good judgment and airmanship;

(4) apply aeronautical knowledge;

(5) maintain control of the balloon at all times in such a manner that the successful outcome of a procedure or manoeuvre is never seriously in doubt.

(d) The following limits are for general guidance. The FE should make allowance for turbulent conditions and the handling qualities and performance of the hot-air balloon used:

Height

(1) normal flight ± 100 ft

(2) with simulated emergency ± 150 ft

CONTENT OF THE SKILL TEST

(e) The contents and sections of the proficiency check set out in this AMC should be used for the extension of BPL privileges to exercise commercial privileges on a hot-air balloon.

SECTION 1 PRE-FLIGHT OPERATIONS, INFLATION AND TAKE-OFF	
Use of checklist, airmanship, control of balloon by external visual reference, look-out procedures, etc. apply in all sections.	
a	Pre-flight documentation, flight planning, NOTAM and weather briefing
b	Balloon inspection and servicing

c	Load calculation
d	Crowd control and crew briefing
e	Passenger briefing
f	Assembly and layout
g	Inflation and pre-take-off procedures
h	Take-off
i	ATC compliance
SECTION 2 GENERAL AIRWORK	
a	Climb to level flight
b	Level flight
c	Descent to level flight
d	Operating at low level
e	ATC compliance
SECTION 3 EN-ROUTE PROCEDURES	
a	Dead reckoning and map reading
b	Marking positions and time
c	Orientation, airspace structure
d	Maintenance of altitude
e	Fuel management
f	Communication with retrieve crew
g	ATC compliance or R/T communication
SECTION 4 APPROACH AND LANDING PROCEDURES	
a	Approach from low level and missed approach and fly on
b	Approach from high level and missed approach and fly on
c	Passenger pre-landing briefing
d	Pre-landing checks
e	Selection of landing field
f	Landing, dragging and deflation
g	ATC compliance or R/T communication
h	Actions after flight

SECTION 5 ABNORMAL AND EMERGENCY PROCEDURES	
This section may be combined with sections 1 through 6	
a	Simulated fire on the ground and in the air
b	Simulated pilot light and burner failures
c	Simulated passenger health problems
d	Other abnormal and emergency procedures as outlined in the appropriate flight manual
e	Oral questions

(f) The contents and sections of the proficiency check set out in this AMC should be used for the extension of BPL privileges to exercise commercial privileges on a gas balloon.

SECTION 1 PRE-FLIGHT OPERATIONS, INFLATION AND TAKE-OFF	
Use of checklist, airmanship, control of balloon by external visual reference, look-out procedures, etc. apply in all sections.	
a	Pre-flight documentation, flight planning and NOTAM and weather briefing
b	Balloon inspection and servicing
c	Load calculation
d	Crowd control and crew briefings
e	Passenger briefing
f	Assembly and layout
g	Inflation and pre-take-off procedures
h	Take-off
i	ATC liaison: compliance
SECTION 2 GENERAL AIRWORK	
a	Climb to level flight
b	Level flight
c	Descent to level flight
d	Operating at low level
e	ATC liaison: compliance
SECTION 3 EN-ROUTE PROCEDURES	
a	Dead reckoning and map reading
b	Marking positions and time

c	Orientation, airspace structure
d	Maintenance of altitude
e	Ballast management
f	Communication with retrieve crew
g	ATC compliance or R/T communication
SECTION 4 APPROACH AND LANDING PROCEDURES	
a	Approach from low level and missed approach and fly on
b	Approach from high level and missed approach and fly on
c	Passenger pre-landing briefing
d	Pre-landing checks
e	Selection of landing field
f	Landing, dragging and deflation
g	ATC compliance or R/T communication
h	Actions after flight
SECTION 5 ABNORMAL AND EMERGENCY PROCEDURES	
This section may be combined with sections 1 through 4	
a	Simulated closed appendix during take-off and climb
b	Simulated parachute or valve failure
c	Simulated passenger health problems
d	Other abnormal and emergency procedures as outlined in the appropriate flight manual
e	Oral questions

AMC1 FCL.110.B; FCL.210.B

FLIGHT INSTRUCTION FOR THE LAPL (B) AND FLIGHT INSTRUCTION FOR THE BPL

(a) Entry to training

Before being accepted for training an applicant should be informed that the appropriate medical certificate must be obtained before solo flying is permitted.

(b) Flight instruction

(1) The LAPL (B) or BPL flight instruction syllabus should take into account the principles of threat and error management and also cover:

(i) pre-flight operations, including load calculations, balloon inspection and servicing;

(ii) crew and passenger briefings;

(iii) inflation and crowd control;

(iv) control of the balloon by external visual reference;

(v) take-off in different wind conditions;

(vi) approach from low and high level;

(vii) landings in different surface wind conditions;

(viii) cross-country flying using visual reference and dead reckoning;

(ix) emergency operations, including simulated balloon equipment malfunctions;

(x) compliance with air traffic services procedures and communication procedures;

(xi) avoidance of nature protection areas, landowner relations.

(2) Before allowing the applicant to undertake his/her first solo flight, the FI should ensure that the applicant can operate the required systems and equipment.

(c) Syllabus of flight instruction (hot-air balloon)

(1) The numbering of exercises should be used primarily as an exercise reference list and as a broad instructional sequencing guide; therefore the demonstrations and practices need not necessarily be given in the order listed. The actual order and content will depend upon the following interrelated factors:

(i) the applicant's progress and ability;

(ii) the weather conditions affecting the flight;

(iii) the flight time available;

(iv) instructional technique considerations;

(v) the local operating environment;

(vi) applicability of the exercises to the balloon type.

(2) Each of the exercises involves the need for the applicant to be aware of the needs of good airmanship and look-out, which should be emphasised at all times.

(i) Exercise 1: Familiarisation with the balloon:

(A) characteristics of the balloon;

(B) the components or systems;

(C) re-fuelling of the cylinders;

(D) instruments and equipment;

(E) use of checklist(s) and procedures.

(ii) Exercise 2: Preparation for flight:

(A) documentation and equipment;

(B) weather forecast and actuals;

(C) flight planning:

(a) NOTAMs

(b) airspace structure;

(c) sensitive areas (for example nature protection areas);

(d) expected track and distance;

(e) pre-flight picture;

(f) possible landing fields.

(D) launch field:

(a) permission;

(b) field selection;

(c) behaviour;

(d) adjacent fields.

(E) load calculations.

(iii) Exercise 3: Crew and passenger briefing:

(A) clothing;

(B) crew briefing;

(C) passenger briefing.

(iv) Exercise 4: Assembly and layout:

(A) crowd control;

(B) rigging envelope, basket and burner;

(C) burner test;

(D) use of restraint line;

(E) pre-inflation checks.

(v) Exercise 5: Inflation:

(A) crowd control;

(B) cold inflation;

(C) use of the inflation fan;

(D) hot inflation.

(vi) Exercise 6: Take-off in different wind conditions:

(A) pre take-off checks and briefings;

(B) heating for controlled climb;

(C) 'hands off and hands on' procedure for ground crew;

(D) assessment of lift;

(E) use of quick release;

(F) assessment of wind and obstacles;

(G) take-off in wind without shelter obstacles;

(H) preparation for false lift.

(vii) Exercise 7: Climb to level flight:

(A) climbing with a predetermined rate of climb;

(B) look-out procedures;

(C) effect on envelope temperature;

(D) maximum rate of climb according to manufacturer's flight manual;

(E) levelling off at selected altitude.

(viii) Exercise 8: Level flight:

(A) maintaining level flight by:

(a) use of instruments only;

(b) use of visual references only;

(c) all available means.

(B) use of parachute and turning vents (if applicable).

(ix) Exercise 9: Descent to level flight:

(A) descent with a predetermined rate of descent;

(B) fast descent;

(C) look-out procedures;

(D) maximum rate of descent according to manufacturer's flight manual;

(E) use of parachute;

(F) parachute stall;

(G) cold descent;

(H) levelling off at selected altitude.

(x) Exercise 10: Emergencies – systems:

(A) pilot light failure;

(B) burner failure, valve leaks, flame out and re-light;

(C) gas leaks;

(D) envelope over temperature;

(E) envelope damage in-flight;

(F) parachute or rapid deflation system failure.

(xi) Exercise 10B: Other emergencies:

(A) fire extinguisher;

(B) fire on ground;

(C) fire in the air;

(D) contact with electrical power lines;

(E) obstacle avoidance;

(F) escape drills, location and use of emergency equipment.

(xii) Exercise 11: Navigation:

(A) maps selection;

(B) plotting expected track;

(C) marking positions and time;

(D) calculation of distance, speed and fuel consumption;

(E) ceiling limitations (ATC, weather and envelope temperature);

(F) planning ahead;

(G) monitoring of weather development and acting so;

(H) monitoring of fuel consumption and envelope temperature;

(I) ATC liaison (if applicable);

(J) communication with retrieve crew;

(K) use of GNSS (if applicable).

(xiii) Exercise 12: Fuel management:

(A) cylinder arrangement and burner systems;

(B) pilot light supply (vapour or liquid);

(C) use of master cylinders (if applicable);

(D) fuel requirement and expected fuel consumption;

(E) fuel state and pressure;

(F) fuel reserves;

(G) cylinder contents gauge and change procedure;

(H) use of cylinder manifolds.

(xiv) Exercise 13: Approach from low level:

(A) pre-landing checks;

(B) passenger pre-landing briefing;

(C) selection of field;

(D) use of burner and parachute;

(E) look-out procedures;

(F) missed approach and fly on.

(xv) Exercise 14: Approach from high level:

(A) pre-landing checks;

(B) passenger pre-landing briefing;

(C) selection of field;

(D) rate of descent;

(E) use of burner and parachute;

(F) look-out procedures;

(G) missed approach and fly on.

(xvi) Exercise 15: Operating at low level:

(A) use of burner, whisper burner and parachute;

(B) look-out procedures;

(C) avoidance of low level obstacles;

(D) avoidance of protection areas;

(E) landowner relations.

(xvii) Exercise 16: Landing in different wind conditions:

(A) pre-landing checks;

(B) passenger pre-landing briefing;

(C) selection of field;

(D) turbulences (in the case of landings with high wind speed only);

(E) use of burner and pilot lights;

(F) use of parachute and turning vents (if applicable);

(G) look-out procedures;

(H) dragging and deflation;

(I) landowner relations;

(J) airmanship.

(xviii) Exercise 17: First solo:

(A) supervised flight preparation;

(B) instructor's briefing, observation of flight and de-briefing.

(d) Syllabus of flight instruction (gas balloon)

(1) The numbering of exercises should be used primarily as an exercise reference list and as a broad instructional sequencing guide; therefore the demonstrations and practices need not necessarily be given in the order listed. The actual order and content will depend upon the following interrelated factors:

(i) the applicant's progress and ability;

(ii) the weather conditions affecting the flight;

(iii) the flight time available;

(iv) instructional technique considerations;

(v) the local operating environment;

(vi) applicability of the exercises to the balloon type.

(2) Each of the exercises involves the need for the pilot-under-training to be aware of the needs of good airmanship and look-out, which should be emphasised at all times.

(i) Exercise 1: Familiarisation with the balloon:

(A) characteristics of the balloon;

(B) the components or systems;

(C) instruments and equipment;

(D) use of checklist(s) and procedures.

(ii) Exercise 2: Preparation for flight:

(A) documentation and equipment

(B) weather forecast and actuals;

(C) flight planning:

(a) NOTAMs;

(b) airspace structure;

(c) sensitive areas (for example nature protection areas);

(d) expected track and distance;

(e) pre-flight picture;

(f) possible landing fields.

(D) launch field:

(a) permission;

(b) behaviour;

(c) adjacent fields.

(E) load calculations.

(iii) Exercise 3: Crew and passenger briefing:

(A) clothing;

(B) crew briefings;

(C) passenger briefing.

(iv) Exercise 4: Assembly and layout:

(A) crowd control;

(B) rigging envelope and basket (balloon with net);

(C) rigging envelope and basket (netless balloon);

(D) ballast check.

(v) Exercise 5: Inflation:

(A) crowd control;

(B) inflation procedure according to manufacturer's flight manual;

(C) avoiding electrostatic discharge.

(vi) Exercise 6: Take-off in different wind conditions:

(A) pre take-off checks and briefings;

(B) prepare for controlled climb;

(C) 'hands off and hands on' procedure for ground crew;

(D) assessment of wind and obstacles;

(E) preparation for false lift.

(vii) Exercise 7: Climb to level flight:

(A) climb with a predetermined rate of climb;

(B) look-out procedures;

(C) maximum rate of climb according to manufacturer's flight manual;

(D) levelling off at selected altitude.

(viii) Exercise 8: Level flight:

(A) maintaining level flight by:

(a) use of instruments only;

(b) use of visual references only;

(c) all available means.

(B) use of parachute or valve.

(ix) Exercise 9: Descent to level flight:

(A) descent with a predetermined rate of descent;

(B) fast descent;

(C) look-out procedures;

(D) maximum rate of descent according to manufacturer's flight manual;

(E) use of parachute or valve;

(F) levelling off at selected altitude.

(x) Exercise 10: Emergencies:

(A) closed appendix during take-off and climb;

(B) envelope damage in-flight;

(C) parachute or valve failure;

(D) contact with electrical power lines;

(E) obstacle avoidance;

(F) escape drills, location and use of emergency equipment.

(xi) Exercise 11: Navigation:

(A) map selection;

(B) plotting expected track;

(C) marking positions and time;

(D) calculation of distance, speed and ballast consumption;

(E) ceiling limitations (ATC, weather and ballast);

(F) planning ahead;

(G) monitoring of weather development and acting so;

(H) monitoring of ballast consumption;

(I) ATC liaison (if applicable);

(J) communication with retrieve crew;

(K) use of GNSS (if applicable).

(xii) Exercise 12: Ballast management:

(A) minimum ballast;

(B) arrangement and securing of ballast;

(C) ballast requirement and expected ballast consumption;

(D) ballast reserves.

(xiii) Exercise 13: Approach from low level:

(A) pre-landing checks;

(B) passenger pre-landing checks;

(C) selection of field;

(D) use of ballast and parachute or valve;

(E) use of trail rope (if applicable);

(F) look-out procedures;

(G) missed approach and fly on.

(xiv) Exercise 14: Approach from high level:

(A) pre-landing checks;

(B) passenger pre-landing checks;

(C) selection of field;

(D) rate of descent;

(E) use of ballast and parachute or valve;

(F) use of trail rope (if applicable);

(G) look-out procedures;

(H) missed approach and fly on.

(xv) Exercise 15: Operating at low level:

(A) use of ballast and parachute or valve;

(B) look-out procedures;

(C) avoidance of low level obstacle;

(D) avoidance of protection areas;

(E) landowner relations.

(xvi) Exercise 16: Landing in different wind conditions:

(A) pre-landing checks;

(B) passenger pre-landing briefing;

(C) selection of field;

(D) turbulences (in the case of landings with high wind speed only);

(E) use of ballast and parachute or valve;

(F) look-out procedures;

(G) use of rip panel;

(H) dragging;

(I) deflation;

(J) avoiding electrostatic discharge;

(K) landowner relations.

(xvii) Exercise 17: First solo:

Note: the exercises 1 to 16 have to be completed and the student must have achieved a safe and competent level before the first solo flight takes place.

(A) supervised flight preparation;

(B) instructor's briefing, observation of flight and de-briefing.

AMC1 FCL.130.B; FCL.220.B

FLIGHT INSTRUCTION FOR THE EXTENSION OF PRIVILEGES TO TETHERED FLIGHTS

(a) The aim of the flight instruction is to qualify LAPL (B) or BPL holders to perform tethered flights.

(b) The flying exercise should cover the following training items:

(1) ground preparations;

(2) weather suitability;

(3) tether points:

(i) upwind;

(ii) downwind.

(4) tether ropes (three point system);

(5) maximum all-up-weight limitation;

(6) crowd control;

(7) pre take-off checks and briefings;

(8) heating for controlled lift off;

(9) 'hands off and hands on' procedure for ground crew;

(10) assessment of lift;

(11) assessment of wind and obstacles;

(12) take-off and controlled climb (at least up to 60 ft – 20m).

AMC1 FCL.135.B; FCL.225.B

THEORETICAL KNOWLEDGE INSTRUCTION FOR THE EXTENSION TO ANOTHER BALLOON CLASS: LAPL (B) AND BPL

(a) The aim of the flight instruction is to qualify LAPL (B) or BPL holders to exercise the privileges on a different class of balloons.

(b) The following classes are recognised:

(1) hot-air balloons;

(2) gas balloons;

(3) hot-air airships.

(c) The ATO should issue a certificate of satisfactory completion of the instruction to licence endorsement.

(d) Theoretical knowledge

The theoretical knowledge syllabus should cover the revision or explanation of:

(1) principles of flight:

(i) operating limitations;

(ii) loading limitations.

(2) operational procedures:

(i) special operational procedures and hazards;

(ii) emergency procedures.

(3) flight performance and planning:

(i) mass considerations;

(ii) loading;

(iii) performance (hot-air balloon, gas balloon or hot-air airship);

(iv) flight planning;

(v) fuel planning;

(vi) flight monitoring.

(4) aircraft general knowledge:

(i) system designs, loads, stresses and maintenance;

(ii) envelope;

(iii) burner (only extension to hot-air balloon or airship);

(iv) fuel cylinders (except gas balloon);

(v) basket or gondola;

(vi) lifting or burning gas;

(vii) ballast (only gas balloon);

(viii) engine (only hot-air airship);

(ix) instruments and indication systems;

(x) emergency equipment.

AMC2 FCL.135.B; FCL.225.B

FLIGHT INSTRUCTION FOR THE EXTENSION TO ANOTHER BALLOON CLASS: LAPL (B) AND BPL

(a) This additional syllabus of flight instruction should be used for the extension of privileges for LAPL (B) and BPL - hot-air balloon to hot-air airship.

(b) The prerequisite for the extension of privileges to hot-air airships is a valid BPL or LAPL for hot-air balloons because a hot-air airship with a failed engine must be handled in a similar manner as a hot-air balloon. The conversion training has to concentrate therefore on the added complication of the engine, its controls and the different operating limitations of a hot-air airship.

(1) The numbering of exercises should be used primarily as an exercise reference list and as a broad instructional sequencing guide; therefore the demonstrations and practices need not necessarily be given in the order listed.

(2) The flying exercises should cover the revision or explanation of the following exercises:

(i) Exercise 1: Familiarisation with the hot-air airship:

(A) characteristics of the hot-air airship;

(B) the components or systems;

(C) instruments and equipment;

(D) use of checklist(s) and procedures.

(ii) Exercise 2: Preparation for flight:

(A) documentation and equipment;

(B) weather forecast and actuals;

(C) flight planning:

(a) NOTAMs;

(b) airspace structure;

(c) sensitive areas;

(d) expected track and distance;

(e) pre-flight picture;

(f) possible landing fields.

(D) launch field:

(a) permission;

(b) behaviour;

(c) field selection;

(d) adjacent fields.

(E) load and fuel calculations.

(iii) Exercise 3: Crew and passenger briefing:

(A) clothing;

(B) crew briefing;

(C) passenger briefing.

(iv) Exercise 4: Assembly and layout:

(A) crowd control;

(B) rigging envelope, gondola, burner and engine;

(C) burner test;

(D) pre-inflation checks.

(v) Exercise 5: Inflation:

(A) crowd control;

(B) cold inflation:

(a) use of restraint line;

(b) use of the inflation fan.

(C) hot inflation.

(vi) Exercise 6: Engine:

(A) identification of main parts and controls;

(B) familiarisation with operation and checking of the engine;

(C) engine checks before take-off.

(vii) Exercise 7: Pressurisation:

(A) pressurisation fan operation;

(B) super pressure and balance between pressure and temperature;

(C) pressure limitations.

(viii) Exercise 8: Take-off:

(A) before take-off checks and briefings;

(B) heating for controlled climb;

(C) procedure for ground crew;

(D) assessment of wind and obstacles.

(ix) Exercise 9: Climb to level flight:

(A) climbing with a predetermined rate of climb;

(B) effect on envelope temperature and pressure;

(C) maximum rate of climb according to manufacturer's flight manual;

(D) level off at selected altitude.

(x) Exercise 10: Level flight:

(A) maintaining level flight by:

(a) use of instruments only;

(b) use of visual references only;

(c) all available means.

(B) maintaining level flight at different air speeds by taking aerodynamic lift into account.

(xi) Exercise 11: Descent to level flight:

(A) descent with a predetermined rate of descent;

(B) maximum rate of descent according to manufacturer's flight manual;

(C) levelling off at selected altitude.

(xii) Exercise 12: Emergencies - systems:

(A) engine failure;

(B) pressurisation failure;

(C) udder failure;

(D) pilot light failure;

(E) burner failure, valve leaks, flame out and re-light;

(F) gas leaks;

(G) envelope over temperature;

(H) envelope damage in-flight.

(xiii) Exercise 12B: Other emergencies:

(A) fire extinguishers;

(B) fire on ground;

(C) fire in the air;

(D) contact with electrical power lines;

(E) obstacle avoidance;

(F) escape drills, location and use of emergency equipment.

(xiv) Exercise 13: Navigation:

(A) map selection and preparation;

(B) plotting and steering expected track;

(C) marking positions and time;

(D) calculation of distance, speed and fuel consumption;

(E) ceiling limitations (ATC, weather and envelope temperature);

(F) planning ahead;

(G) monitoring of weather development and acting so;

(H) monitoring of fuel and envelope temperature or pressure;

(I) ATC liaison (if applicable);

(J) communication with ground crew;

(K) use of GNSS (if applicable).

(xv) Exercise 14: Fuel management:

(A) engine arrangement and tank system;

(B) cylinder arrangement and burner systems;

(C) pilot light supply (vapour or liquid);

(D) fuel requirement and expected fuel consumption for engine and burner;

(E) fuel state and pressure;

(F) fuel reserves;

(G) cylinder and petrol tank contents gauge.

(xvi) Exercise 15: Approach and go-around:

(A) pre-landing checks;

(B) selection of field into wind;

(C) use of burner and engine;

(D) look-out procedures;

(E) missed approach and go-around.

(xvii) Exercise 16: Approach with simulated engine failure:

(A) pre-landing checks;

(B) selection of field;

(C) use of burner;

(D) look-out procedures;

(E) missed approach and go-around.

(xviii) Exercise 17: Operating at low level:

(A) use of burner and engine;

(B) look-out procedures;

(C) avoidance of low level obstacles;

(D) avoidance of sensitive areas (nature protection areas) or landowner relations.

(xix) Exercise 18: Steering:

(A) assessment of wind;

(B) correcting for wind to steer a given course.

(xx) Exercise 19: Final landing:

(A) pre-landing checks;

(B) use of burner and engine;

(C) look-out;

(D) deflation;

(E) landowner relations.

AMC3 FCL.135.B; FCL.225.B

CONTENTS OF THE SKILL TEST FOR THE EXTENSION OF A LAPL(B) OR A BPL TO ANOTHER BALLOON CLASS (HOT-AIR AIRSHIP)

(a) The take-off site should be chosen by the applicant depending on the actual meteorological conditions, the area which has to be overflown and the possible options for suitable landing sites. The applicant should be responsible for the flight planning and should ensure that all equipment and documentation for the execution of the flight are on board.

(b) An applicant should indicate to the FE the checks and duties carried out. Checks should be completed in accordance with the flight manual or the authorised checklist for the balloon on which the test is being taken. During pre-flight preparation for the test the applicant should be required to perform crew and passenger briefings and demonstrate crowd control. The load calculation should be performed by the applicant in compliance with the operations manual or flight manual for the hot-air airship used.

FLIGHT TEST TOLERANCE

(c) The applicant should demonstrate the ability to:

(1) operate the hot-air airship within its limitations;

(2) complete all manoeuvres with smoothness and accuracy;

(3) exercise good judgment and airmanship;

(4) apply aeronautical knowledge;

(5) maintain control of the airship at all times in such a manner that the successful outcome of a procedure or manoeuvre is never seriously in doubt.

CONTENT OF THE SKILL TEST

(d) The skill test contents and sections set out in this AMC should be used for the skill test for the issue of a LAPL(B) and BPL hot-air airship extension.

SECTION 1 PRE-FLIGHT OPERATIONS, INFLATION AND TAKE-OFF	
Use of checklist, airmanship, control of hot-air airship by external visual reference, look-out procedures, etc. apply in all sections.	
a	Pre-flight documentation, flight planning, NOTAM and weather briefing
b	Hot-air airship inspection and servicing
c	Load calculation
d	Crowd control, crew and passenger briefings
e	Assembly and layout
f	Inflation and pre-take-off procedures

g	Take-off
h	ATC compliance (if applicable)
SECTION 2 GENERAL AIRWORK	
a	Climb to level flight
b	Level flight
c	Descent to level flight
d	Operating at low level
e	ATC compliance (if applicable)
SECTION 3 EN-ROUTE PROCEDURES	
a	Dead reckoning and map reading
b	Marking positions and time
c	Orientation and airspace structure
d	Plotting and steering expected track
e	Maintenance of altitude
f	Fuel management
g	Communication with ground crew
h	ATC compliance (if applicable)
SECTION 4 APPROACH AND LANDING PROCEDURES	
a	Approach, missed approach and go-around
b	Pre-landing checks
c	Selection of landing field
d	Landing and deflation
e	ATC compliance (if applicable)
f	Actions after flight
SECTION 5 ABNORMAL AND EMERGENCY PROCEDURES	
This section may be combined with Sections 1 through 4	
a	Simulated fire on the ground and in the air
b	Simulated pilot light-, burner- and engine-failure
c	Approach with simulated engine failure, missed approach and go-around
d	Other abnormal and emergency procedures as outlined in the appropriate flight manual

e	Oral questions

AMC1 FCL.225.B BPL - Extension of privileges to another balloon class or group

(a) The aim of the flight training is to qualify BPL holders to exercise the privileges on a different class or group of balloons.

(b) The following classes should be recognised:

(1) hot-air balloons;

(2) gas balloons;

(3) hot-air airships.

(c) The following groups should be recognised:

(1) group A:

(i) hot-air balloons and hot-air airships with a maximum envelope capacity of 3 400m³;

(ii) gas balloons with a maximum envelope capacity of 1 260m³.

(2) group B:

(i) hot-air balloons and hot-air airship with an envelope capacity between 3 401m³ and 6 000m³;

(ii) gas balloons with an envelope capacity of more than 1 260m³.

(3) group C:

hot-air balloons and hot-air airship with an envelope capacity between 6 001m³ and 10 500m³.

(4) group D:

hot-air balloons and hot-air airships with an envelope capacity of more than 10 500m³.

(d) An extension to group B is also valid for group A. The extension for the group C is also valid for the groups A and B. An extension to group D will include the privilege for the other three groups.

(e) The ATO should issue a certificate of satisfactory completion of the instruction as required by point FCL.225.B(a) for licence endorsement.

SUBPART D - COMMERCIAL PILOT LICENCE - CPL

AMCs and GM to SECTION 1 – Common requirements

AMC1 FCL.310; FCL.515 (b); FCL.615 (b) - Theoretical knowledge examinations

LEARNING OBJECTIVES FOR ATPL, CPL, IR, CB-IR(A)

(a) Aeroplanes and helicopters

GENERAL

In the tables of this AMC, the applicable LOs for each licence or rating are marked with an 'X'.

The LOs define the subject knowledge and applied knowledge, skills and attitudes that a student pilot should have assimilated during the theoretical knowledge course.

The LOs are intended to be used by an approved training organisation (ATO) when developing the Part-FCL theoretical knowledge elements of the appropriate course. It should be noted, however, that the LOs do not provide a ready-made ground training syllabus for individual ATOs, and should not be seen by organisations as a substitute for thorough course design. Adherence to the LOs should become part of the ATO's compliance monitoring scheme as required by ORA.GEN.200(a)(6).

ATOs are required to produce a training plan for each of their courses based on the instructional systems design (ISD) methodology as specified in AMC2 ORA.ATO.230.

Additional guidance on the meaning and taxonomy of the verbs used in the LOs can be found in GM1 FCL.310, FCL.515(b), and FCL.615(b).

TRAINING AIMS

After completion of the training, a student pilot should:

- be able to understand and apply the subject knowledge in order to be able to identify and manage threats and errors effectively;
- meet at least the Area 100 KSA minimum standard.

INTERPRETATION

The abbreviations used are ICAO abbreviations listed in ICAO Doc 8400 'ICAO Abbreviations and Codes', or those listed in GM1 FCL.010.

Where an LO refers to a definition, e.g. 'Define the following terms' or 'Define and understand' or 'Explain the definitions in …', candidates are also expected to be able to recognise a given definition.

The General Student Pilot Route Manual (GSPRM) contains planning data plus aerodrome and approach charts that may be used in theoretical knowledge training courses. The guidelines on its content can be found in this AMC, in front of the LO table for Subject 033 'Flight planning and monitoring'.

Extracts from any aircraft manuals including but not limited to CAP 696, 697 and 698 for aeroplanes, and CAP 758 for helicopters may be used in training. Where questions refer to excerpts from aircraft manuals, the associated aircraft data will be provided in the examinations.

Some numerical data (e.g. speeds, altitudes/levels and masses) used in questions for theoretical knowledge examinations may not be representative for helicopter operations, but the data is satisfactory for the calculations required.

Note: In all subject areas, the term 'mass' is used to describe a quantity of matter, and 'weight' when describing the force. However, the term 'weight' is normally used in aviation to colloquially describe mass. The pilot should always note the units to determine whether the term 'weight' is being used to describe a force (e.g. unit newton) or quantity of matter (e.g. unit kilogram).'

DETAILED THEORETICAL KNOWLEDGE SYLLABUS AND LOs FOR ATPL, CPL, IR, CB-IR(A)

GENERAL

The detailed theoretical knowledge syllabus outlines the topics that should be taught and examined in order to meet the theoretical knowledge requirements appropriate to ATPL, MPL, CPL, IR, CB-IR(A).

For each topic in the detailed theoretical knowledge syllabus, one or more LOs are set out in the appendix to AMC1 FCL.310; FCL.515(b); FCL.615(b) theoretical knowledge examinations, by subject as described below:

- subject 010 air law
- subject 021 aircraft general knowledge — airframe, systems and power plant
- subject 022 aircraft general knowledge — instrumentation
- subject 031 flight performance and planning — mass and balance
- subject 032 flight performance and planning — performance — aeroplanes
- subject 033 flight performance and planning — flight planning and monitoring
- subject 034 flight performance and planning — performance — helicopters
- subject 040 human performance and limitations
- subject 050 meteorology
- subject 061 navigation — general navigation
- subject 062 navigation — radio navigation
- subject 070 operational procedures
- subject 081 principles of flight — aeroplanes
- subject 082 principles of flight — helicopters
- subject 090 communications
- subject area 100 knowledge, skills and attitudes (ksa)

(b) Airships

SYLLABUS OF THEORETICAL KNOWLEDGE FOR CPL AND IR

The syllabus of theoretical knowledge and examinations is detailed in Appendix to AMC1 FCL.310; FCL.515(b); FCL.615(b) theoretical knowledge examinations, by subject.

GM1 FCL.310; FCL.515(b); FCL.615(b) - Theoretical knowledge examinations

EXPLANATION OF THE VERBS USED IN THE BENJAMIN BLOOM TAXONOMY

(a) The depth or level of learning to be achieved during the training and the corresponding level of attainment to be examined or assessed is based on the following taxonomy. In each case, the level of knowledge or skill is signified by the learning objective (LO) verb.

(b) The majority of the LOs relate to the cognitive domain. The taxonomy described by B. Bloom (1956) and Anderson & Krathwohl (2001) has been used as the standard.

(c) The six sequential increasing levels of required cognitive learning are identified by the LO verb. Hence the lowest level 'remember' is signified by verbs such as 'state', 'list', 'define' and 'recall' whilst the next higher level of 'understand' is signified by verbs such as 'describe' and 'explain'. The third level of 'apply' is signified by the verbs 'calculate', 'interpret', 'relate' and 'solve'. However, the higher levels of 'analyse', which would be signified by the verbs 'plan' or 'discuss' and 'evaluate' and 'create' are less common due at least partially to questions presently possible in the ECQB examination.

(d) The LOs used in Area 100 KSA differ in that they require a combination of knowledge and skills.

However, the 'skill' level does not relate to Bloom's psychomotor taxonomy but is more closely aligned to the higher taxonomy levels required in medicine, because knowledge and skills must be combined by the student pilot in a strategy.

(e) The verbs 'demonstrate' and 'show', with their meanings defined below, have therefore been used to supplement the cognitive LO verbs for the Area 100 KSA LOs.

(1) 'Demonstrate' means the selection and use of the appropriate knowledge, skills and attitudes within a strategy to achieve an effective outcome. It signifies a high taxonomy level and would normally be assessed using multiple indicators from more than one core competency.

(2) 'Show' means the attainment of knowledge, skill or attitude. It signifies a lower taxonomy level than 'demonstrate' and would normally be assessed by a single indicator.'

AMCs and GM to SECTION 2 – Specific requirements for the aeroplane category – CPL(A)

Reserved

SUBPART E - MULTI-CREW PILOT LICENCE – MPL

Reserved

SUBPART F - AIRLINE TRANSPORT PILOT LICENCE - ATPL

AMCs and GM to SECTION 1 – Common requirements

AMC1 FCL.310; FCL.515 (b); FCL.615 (b) - Theoretical knowledge examinations

The content of AMC1 to FCL.515 (b)is detailed within AMC 1 FCL.310, FCL.515 (b) and FCL.615 (b) available in AMCs to Subpart D.

GM1 FCL.310; FCL.515(b); FCL.615(b) - Theoretical knowledge examinations

The content of GM1 to FCL.515 (b) is detailed within GM1 FCL.310, FCL.515 (b) and FCL.615 (b) available in AMCs and GM to Subpart D.

AMC1 FCL.520.A; FCL.520.H

ATPL SKILL TEST

The ATPL skill test may serve at the same time as a skill test for the issue of the licence and a proficiency check for the revalidation of the type rating for the aircraft used in the test and may be combined with the skill test for the issue of a MP type rating.

AMCs and GM to SECTION 2 – Specific requirements for the aeroplane category – ATPL(A)

Reserved

AMCs and GM to SECTION 3 – Specific requirements for the helicopter category – ATPL(H)

Reserved

SUBPART G - INSTRUMENT RATING - IR

AMCS and GM to SECTION 1 - Common Requirements

AMC1 FCL.310; FCL.515 (b); FCL.615 (b) - Theoretical knowledge examinations

The content of AMC1 to FCL.615 (b)is detailed within AMC 1 FCL.310, FCL.515 (b) and FCL.615 (b) available in AMCs to Subpart D.

GM1 FCL.310; FCL.515(b); FCL.615(b) - Theoretical knowledge examinations

The content of GM1 to FCL.615 (b)is detailed within GM1 FCL.310, FCL.515 (b) and FCL.615 (b) available in AMCs and GM to Subpart D.

AMC1 FCL.615(b) IR - Theoretical knowledge and flight instruction

SYLLABUS OF THEORETICAL KNOWLEDGE FOR THE IR FOLLOWING THE COMPETENCY-BASED MODULAR COURSE

(a) The syllabus for the theoretical knowledge instruction and examination for the ATPL, MPL, CPL and IR in AMC1 FCL.310, FCL.515(b) and FCL.615(b) should be used for the CB-IR(A).

(b) Aspects related to threat and error management (TEM) should be included in an integrated manner, taking into account the particular risks associated to the licence and the activity.

(c) The applicant who has completed a modular IR(A) course according to Appendix 6 Section A and passed the IR(A) theoretical knowledge examination should be fully credited towards the requirements of theoretical knowledge instruction and examination for a competency-based IR(A) within the validity period of the examination. An applicant wishing to transfer to a competency-based IR(A) course during a modular IR(A) course should be credited towards the requirements of theoretical knowledge instruction and examination for a competency-based IR(A) for those subjects or theory items already completed.

AMC1 FCL.625 IR - Validity, revalidation and renewal

(a) When issuing or renewing a rating or certificate, the CAAT or, in the case of renewal, an examiner specifically authorised by the CAAT, should extend the validity period until the end of the relevant month.

(b) When revalidating a rating, an instructor or an examiner certificate, the CAAT, or an examiner specifically authorised by the CAAT, should extend the validity period of the rating or certificate until the end of the relevant month.

(c) The CAAT, or an examiner specifically authorised for that purpose by the CAAT, should enter the expiry date on the licence or the certificate.

AMC1 FCL.625(c) IR - Validity, revalidation and renewal

RENEWAL OF INSTRUMENT RATING AT AN APPROVED TRAINING ORGANISATION (ATO): REFRESHER TRAINING

(a) The objective of the refresher training at an ATO is to reach the level of proficiency needed to pass the instrument rating proficiency check, as described in Appendix 9, or the instrument rating skill test as described in Appendix 7 to Part-FCL, as applicable. The amount of refresher training needed should be determined by the ATO on a case-by-case basis, taking into account the following factors:

(1) the experience of the applicant;

(2) the amount of time elapsed since the privileges of the rating were last used;

(3) the complexity of the aircraft;

(4) whether the applicant has a current rating on another aircraft type or class; and

(5) where considered necessary, the performance of the applicant during a simulated proficiency check for the rating in a flight simulation training device (FSTD) or an aircraft of a relevant type or class.

The amount of training needed to reach the desired level of competency should increase with the time elapsed since the privileges of the rating were last used.

(b) Once the ATO has determined the needs of the applicant, it should develop an individual training programme based on the ATO's approved course for the rating and focusing on those aspects where the applicant has shown the greatest needs. Theoretical-knowledge instruction should be included, as necessary. The performance of the applicant should be reviewed during the training, and additional instruction should be provided where necessary to reach the standard required for the proficiency check.

(c) After successful completion of the training, the ATO should provide a training completion certificate to the applicant, which describes the evaluation of the factors listed under (a) above and the training received, and includes a statement that the training has been successfully completed. The training completion certificate should be presented to the examiner prior to the proficiency check. Following the successful renewal of the rating, the training completion certificate and examiner report form should be submitted to the CAAT.

(d) Taking into account the factors listed in (a) above, an ATO may also decide that the applicant already possesses the required level of proficiency and that no refresher training is necessary. In such a case, the certificate or other documental evidence referred to in point (c) above should contain a respective statement including sufficient reasoning.

AMCS and GM to SECTION 2 – Specific requirements for the aeroplane category

Reserved

AMCS and GM to SECTION 3 – Specific requirements for the helicopter category

Reserved

AMCS and GM to SECTION 4 – Specific requirements for the airship category

Reserved