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The Civil Aviation Authority of Thailand

Acceptable Means of Compliance and Guidance Material to TCAR PEL Part - ATCO ATCO.D.010 (AMC/GM to TCAR PEL Part - ATCO ATCO.D.010)

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Approved By

Air Chief Marshal

Manat Chavanaprayoon
Director General
The Civil Aviation Authority of Thailand

THAILAND CIVIL AVIATION REGULATION (TCAR)

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RECORD OF REVISIONS

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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.

INITIAL TRAINING CONTENT

AMC1 ATCO.D.010(a) Composition of initial training

GENERAL

1. Structure of the basic and rating training syllabi

(a) The basic and rating training syllabi have been structured as follows:

(1) The syllabus is divided into subjects, which are divided into topics that are in turn divided into subtopics. This structure serves the definition and classification of the objectives. There can be one or several objectives linked to each subtopic.

(2) Objectives are assigned to a specific subject which deals with the knowledge and skills needed to accomplish the related subject objective.

(3) Subjects, topics and subtopics are contained in Appendices 2 to 8 to TCAR PEL Part ATCO, and are repeated in:

— AMC1 ATCO.D.010(a)(1) Composition of initial training — BASIC TRAINING — SUBJECT OBJECTIVES AND TRAINING OBJECTIVES;

— AMC1 ATCO.D.010(a)(2)(i) Composition of initial training — AERODROME CONTROL VISUAL RATING (ADV) TRAINING — SUBJECT OBJECTIVES AND TRAINING OBJECTIVES;

— AMC1 ATCO.D.010(a)(2)(ii) Composition of initial training — AERODROME CONTROL INSTRUMENT RATING FOR TOWER ADI (TWR) TRAINING — SUBJECT OBJECTIVES AND TRAINING OBJECTIVES;

— AMC1 ATCO.D.010(a)(2)(iii) Composition of initial training — APPROACH CONTROL PROCEDURAL RATING (APP) TRAINING — SUBJECT OBJECTIVES AND TRAINING OBJECTIVES;

— AMC1 ATCO.D.010(a)(2)(iv) Composition of initial training — AREA CONTROL PROCEDURAL RATING (ACP) TRAINING — SUBJECT OBJECTIVES AND TRAINING OBJECTIVES;

— AMC1 ATCO.D.010(a)(2)(v) Composition of initial training — APPROACH CONTROL SURVEILLANCE RATING (APS) TRAINING — SUBJECT OBJECTIVES AND TRAINING OBJECTIVES

— AMC1 ATCO.D.010(a)(2)(vi) Composition of initial training — AREA CONTROL SURVEILLANCE RATING (ACS) TRAINING — SUBJECT OBJECTIVES AND TRAINING OBJECTIVES

in order to provide the reader with a comprehensive and unique reference document for the basic and each of the rating trainings. Subject objectives and training objectives are included in and form an integral part of each of the aforementioned AMC.

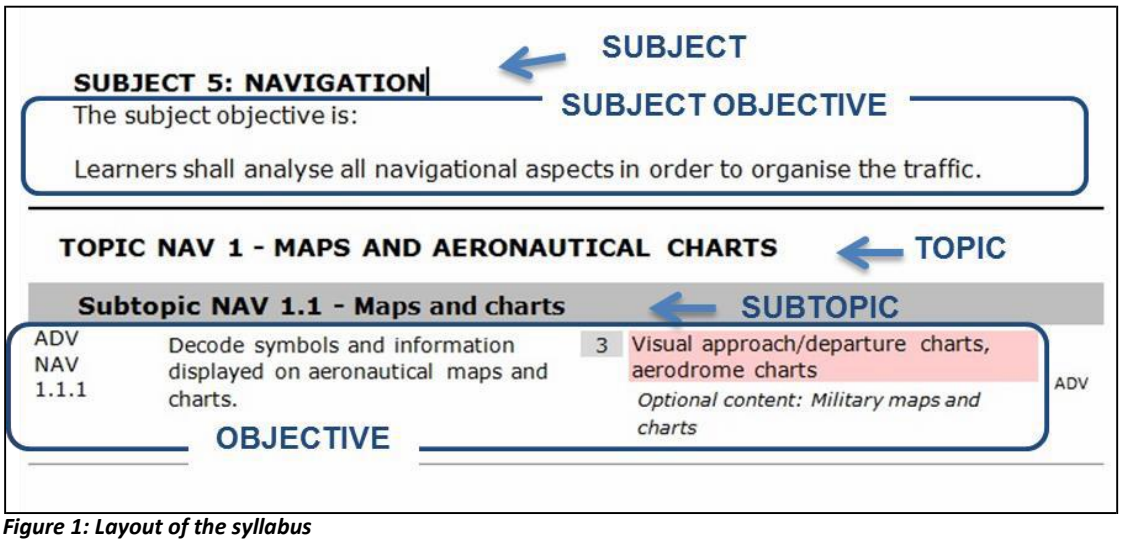


Figure 1: Layout of the syllabus

(b) The following principles may be applied to the development of a training course that is based on any of the syllabi:

(1) The structure of the syllabi and the order of the objectives contained therein is neither intended to convey a pedagogical sequence nor to indicate a relative level of importance.

(2) No objective from the basic training syllabus is repeated as 'a refresher' in the rating training syllabi.

(3) The number of objectives contained within a subtopic does not necessarily signify how long it should take to teach that subtopic. For example, a subtopic containing five relatively straightforward objectives, may take a shorter time to be taught than another subtopic containing two complex objectives.

2. Structure of the objectives

(a) An objective consists of three elements:

(1) The corpus, which is a description of the required performance. It always contains an action verb to ensure that the outcome is observable. The action verb is always associated with a defined taxonomy.

(2) The level, which indicates numerically the taxonomy of the action verb.

(3) The content, which may be implicit or explicit. The explicit content is written in the content field, while the implicit content is not but, instead, is implied in the corpus of the objective and other elements (syllabus, subject, etc.). Content that is a required part of the objective is written in the red-shaded field. Optional content, written in italics, may be used if considered appropriate.

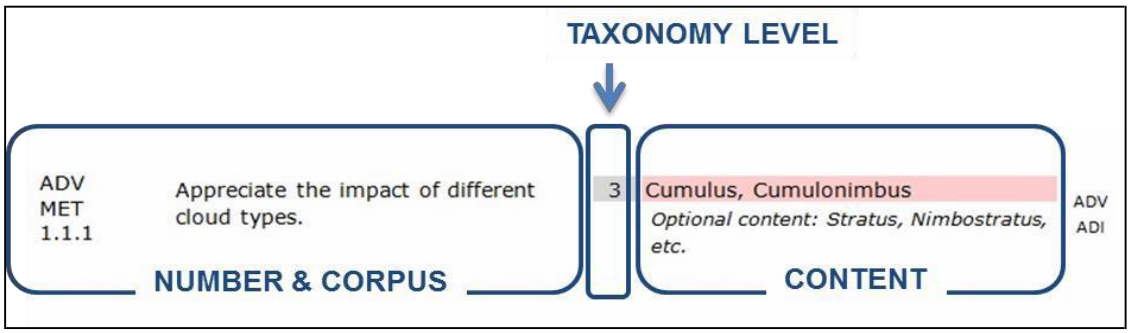
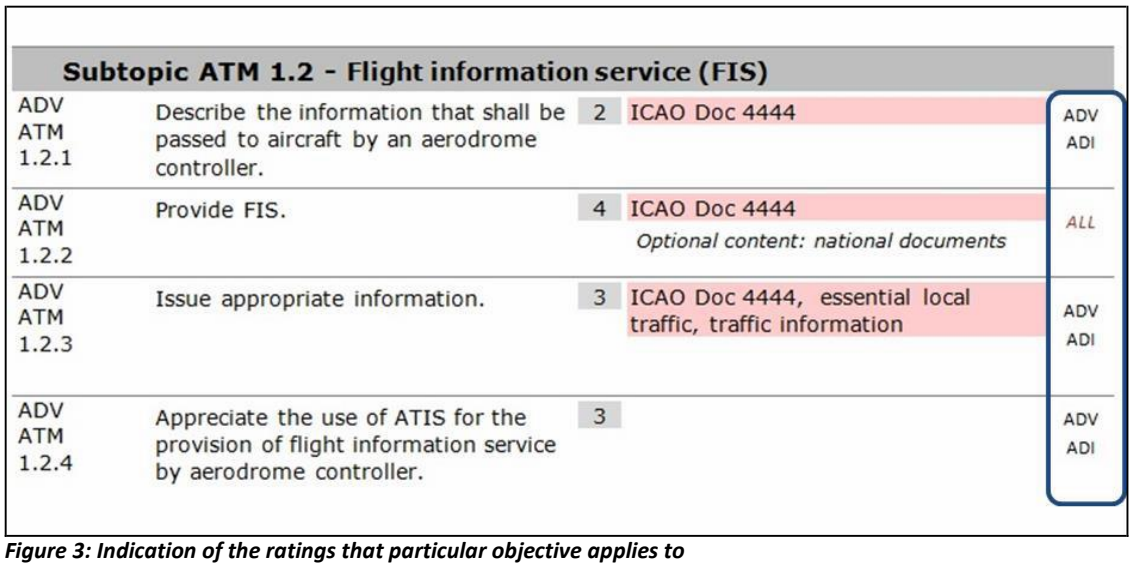


Figure 2: Layout of an objective

3. Repeated and common objectives

(a) Repeated and common objectives are only applicable to rating training.

(b) To the right of each objective, there is an indication of which other ratings contain this particular objective. If the rating is indicated in red italics, it notifies the reader that the objective(s) is (are) verbatim in each rating; however, the objective numbers are different. This indication is the first step to help the training providers identify the potential commonalities between the various syllabi. As a second step, the training provider must determine, at the level of local implementation, whether the objective is to be regarded as repeated or common.



Subtopic ATM 1.2 - Flight information service (FIS)				
ADV ATM 1.2.1	Describe the information that shall be passed to aircraft by an aerodrome controller.	2	ICAO Doc 4444	ADV ADI
ADV ATM 1.2.2	Provide FIS.	4	ICAO Doc 4444 *Optional content: national documents*	*ALL*
ADV ATM 1.2.3	Issue appropriate information.	3	ICAO Doc 4444, essential local traffic, traffic information	ADV ADI
ADV ATM 1.2.4	Appreciate the use of ATIS for the provision of flight information service by aerodrome controller.	3		ADV ADI

Figure 3: Indication of the ratings that particular objective applies to

3.1 Repeated objectives

All the objectives appearing in a syllabus are implicitly appropriate to this syllabus. As a consequence, objectives may be repeated 'verbatim' in different rating syllabi and nevertheless specify a different performance. The reader always needs to mentally add the sentence 'in this syllabus context' at the end of each objective.

For example, the objective 'use approved phraseology' is repeated (same level, same corpus, same content) in all the syllabi but is different because the context is different in each syllabus (a learner that is able to use approved phraseology for en-route traffic will need additional training before mastering the phraseology in the provision of aerodrome control).

3.2 Common objectives

(a) Common objectives are verbatim the same objectives that appear in more than one rating syllabi in the same context so that they do not need to be taught again in case of combined or successively organised courses.

For example, the objective 'describe the human information-processing model' is common for all the syllabi because the context is non-specific and is, therefore, not determined by the type of rating.

(b) As a general principle, the rating subject 'Human Factors' is identical in each of the rating training syllabi and can be considered as containing common objectives because the context is always the same. This means that the rating training objectives relating to Human Factors need to be taught only once. If a learner acquires an additional rating, that learner would not be required to repeat the Human Factors objectives.

4. Action verbs that support the taxonomy for training objectives

(a) The five taxonomy levels should be understood to have the following levels of complexity:

(1) Action verbs for Level 1

Level 1 — A basic knowledge of the subject. It is the ability to remember essential points, to memorise data and retrieve it.

L1 Verb	Definition	Example
Define	State what it is and what its limits are; state the definition.	Define ATC service.
Draw	Produce a picture, pattern or diagram.	Draw the block diagram. Draw a holding pattern.
List	Say one after the other.	List the main structure components of an aircraft.
Name	Give name of objects or procedures.	Name the components of an ILS. Name the key national and international aviation organisations.
Quote	Repeat what is written or said.	Quote ICAO definition of ATC service.
Recognise	To know what it is because you have seen it before.	Recognise the information contained in the different parts of the AIP.
State	Say or write in a formal or definite way.	State the meteorological hazards to aviation.

(2) Action verbs for Level 2

Level 2 — The ability to understand and to discuss the subject matter intelligently in order to represent and act upon certain objects and events.

L2 Verb	Definition	Example
Characterise	To describe the quality of features in something.	Characterise the main items of ATC equipment.
Consider	To think carefully about it.	Consider the benefits of Critical Incident Stress Management (CISM).
Demonstrate	Describe and explain; logically or mathematically prove the truth of a statement.	Demonstrate the importance of good communication in ATC.
Describe	Say what it is like or what happened.	Describe the methods by which ICAO notifies and implements legislation.
Differentiate	Show the differences between things.	Differentiate between different types of visibility.
Explain	Give details about something or describe so that it can be understood.	Explain the purpose and function of ICAO.
Take account of	Take into consideration before deciding.	Take account of the wind influence when calculating a ground speed. Take account of the limitations of equipment and systems.

(3) Action verbs for Level 3

Level 3 — A thorough knowledge of the subject and the ability to apply it with accuracy. The ability to make use of the repertoire of knowledge to develop plans and activate them.

L3 Verb	Definition	Example
Act	Carry out, execute.	Act to reduce stress.
Apply	Use something in a situation or activity.	Apply separation.
Appreciate	To understand a situation and know what is involved in a problem-solving situation, to state a plan without applying it.	Appreciate the necessity for coordination (the learner says that the coordination will be done and with whom; the learner does not perform the actual coordination).
Assist	Help somebody to do a job by doing part of it.	Assist the pilot.
Calculate	To discover from information you already have by arithmetic; to think about a possible cause of action in order to form an opinion or decide what to do.	Calculate appropriate levels. Calculate conversions between the three north designations.
Check	Make sure the information is correct (satisfactory).	Check the accuracy of flight data information. Check availability of information material.
Choose	Select out of number, decide to do one thing rather than another.	Choose appropriate levels. Choose which aircraft should be vectored.
Collect	Assemble, accumulate, bring or come together.	Collect examples of different types of error, their causes and consequences for ATC.
Conduct	Organise and carry out.	Conduct coordination.

L3 Verb	Definition	Example
Confirm	Establish more firmly, corroborate.	Confirm sequence order.
Decode	Turn into ordinary writing, decipher.	Decode the content of weather reports and forecast.
Encode	Put into code or cipher.	Encode and decode flight plans (including supplementary information).
Estimate	Form an approximate judgement of a number, form an opinion.	Estimate distance and direction between two points.
Execute	Perform action.	Execute corrective actions.
Extract	Copy out, make extracts from, find, deduce.	Extract pertinent data from relevant sources to produce a flight progress display.
Identify	Associate oneself inseparably with, establish the identity.	Identify the role of ATC as a service provider and the requirements of the ATS users. Identify an aircraft.
Inform	Tell, give facts or information.	Inform supervisor of situation.
Initiate	Begin, set going, originate.	Initiate appropriate coordination.
Input	Enter in the system.	Input data.
Issue	Send forth, publish.	Issue appropriate ATC clearances. Issue appropriate traffic information.
Maintain	Cause or enable to continue.	Maintain flight data display.
Measure	Ascertain extent or quality of (thing) by comparison with fixed unit or with object of known size.	Measure distance on a map.
Monitor	Keep under observation.	Monitor traffic. Monitor the effect of human information-processing factors on decision-making.
Notify	Make known, announce, report.	Notify runway in use.
Obtain	Acquire easily without research.	Obtain meteorological information. Obtain information from the relieving controller.
Operate	Conduct work on equipment.	Operate the equipment of the controller working position.
Pass	Move, cause to go, transmit.	Pass essential traffic information without delay.
Perform	Carry into effect, go through, execute.	Perform communication effectively.
Process	To put through the steps of a prescribed procedure.	Process pertinent data on data displays.
Record	Register, set down for remembrance or reference.	Record information by writing effectively.
Relay	Receive and pass on, broadcast.	Relay meteorological information from pilot reports.
Respond	Provide an answer, perform answering or corresponding action.	Respond to loss/doubt concerning identification. Respond to distress and urgency messages and signals.
Scan	Continuously observe rapidly, sequentially and selectively in order to extract relevant data.	Scan data display.
Transfer	Hand over.	Transfer information to the relieving controller.

L3 Verb	Definition	Example
Update	Refresh, bring up to date.	Update the data display to accurately reflect the traffic situation.
Use	Employ for a purpose, handle as instrument, put into operation.	Use approved phraseology. Use the available means for coordination.
Verify	Establish truth of.	Verify the mode C information.

(4) Action verbs for Level 4

Level 4 — Ability to establish a line of action within a unit of known applications following the correct chronology and the adequate method to resolve a problematic situation. This involves the integration of known applications in a familiar situation.

L4 Verb	Definition	Example
Acquire	Gain by oneself and for oneself, obtain after research.	Acquire relevant aeronautical information.
Adjust	Change to a new position, value or setting.	Adjust the surveillance system display.
Allocate	Assign, devote.	Allocate levels (height, altitude, flight level) according to altimetry data.
Analyse	Examine minutely the constitution of.	Analyse examples of pilot–controller communication for effectiveness. Analyse the information provided by the radar equipment.
Assign	Designate or set an element.	Assign codes.
Coordinate	Negotiate with others in order to work together effectively.	Coordinate runway in use. Coordinate when providing FIS.
Comply	Act in accordance with.	Comply with rules.
Delegate	Commit authority to somebody.	Delegate separation to pilots in the case of aircraft executing successive visual approaches.
Detect	Discover existence of.	Detect potential conflict.
Ensure	Make safe, make certain.	Ensure the agreed course of action is carried out.
Expedite	Assist the progress of, do speedily.	Expedite traffic.
Integrate	Combine into a whole, complete by addition of parts.	Integrate appropriate ATC clearances in control service.
Manage	Handle, conduct, maintain control over something, be in charge of.	Manage traffic on the manoeuvring area. Manage traffic in accordance with procedural changes.
Organise	Give orderly structure to, frame and put into working order.	Organise pertinent data on data displays. Organise priority of actions.
Predict	Forecast.	Predict positions of aircraft in the aerodrome traffic and taxi circuits.
Provide	Supply, furnish.	Provide radar separation. Provide FIS.
Relate	Establish link with.	Relate a pressure setting to an altitude.

(5) Action verbs for Level 5

Level 5 — Ability to analyse new situation in order to elaborate and apply one or other relevant strategy to solve a complex problem. The defining feature is that the situation is qualitatively different from those previously met, requiring judgement and evaluation of options.

L5 verb	Definition	Example
Assess	Estimate value or difficulty, evaluate, appraise.	Assess workload.
Balance	Weigh (a question, two arguments, etc., against each other).	Balance the workload with the traffic demand.
Discuss	Investigate by reasoning or argument.	Discuss the impact of regulation.
Evaluate	Ascertain amount of, find numerical expression for.	Evaluate the necessary information to be provided to pilots in need of navigational assistance.
Interpret	To decide on something's meaning or significance when there is a choice.	Interpret operational information.
Optimise	To make optimal; get the most out of; use best; modify to achieve maximum efficiency.	Optimise the use of support tools.
Resolve	Solve, clear up, settle.	Resolve conflict.
Select	Pick out as best or most suitable.	Select the runway in use.
Theorise	Extract general principles from a particular experience.	Theorise the resolution of conflict between a slow and a fast aircraft.
Validate	Make valid, ratify, prove valid, show or confirm the validity of something.	Validate one radar vectoring option to expedite the traffic.

(b) Application of taxonomy levels to practically based objectives

(1) Objectives at taxonomy level 3 or higher, which are of a practical nature, related to all subjects except ATM, may be achieved by any suitable type of practical training methods, e.g. hands on, plotting on charts, etc.

(2) Objectives at taxonomy level 3 or higher, for the ATM subject (basic and rating), are practical by nature and require the integration of several knowledge areas and skills at the same time, e.g. vectoring of an aircraft requires knowledge and skills in the areas of radiotelephony, aircraft performance, navigation and radar theory. Therefore, ATM level 3 objectives should be achieved through the use of a part-task trainer or a simulator.

(3) ATM level 4 objectives should be achieved for the most part through the use of a simulator. A part-task trainer, which presents operational situations at an enforced pace, may be used to achieve some ATM level 4 objectives.

(4) ATM level 5 objectives should be achieved through the use of a simulator.

AMC2 ATCO.D.010(a) Composition of initial training

LIST OF ABBREVIATIONS

For the purposes of:

— AMC1 ATCO.D.010(a)(1) Composition of initial training — BASIC TRAINING — SUBJECT OBJECTIVES AND TRAINING OBJECTIVES

— AMC1 ATCO.D.010(a)(2)(i) Composition of initial training — AERODROME CONTROL VISUAL RATING (ADV) TRAINING — SUBJECT OBJECTIVES AND TRAINING OBJECTIVES

— AMC1 ATCO.D.010(a)(2)(ii) Composition of initial training — AERODROME CONTROL INSTRUMENT RATING FOR TOWER ADI (TWR) TRAINING — SUBJECT OBJECTIVES AND TRAINING OBJECTIVES

— AMC1 ATCO.D.010(a)(2)(iii) Composition of initial training — APPROACH CONTROL PROCEDURAL RATING (APP) TRAINING — SUBJECT OBJECTIVES AND TRAINING OBJECTIVES

— AMC1 ATCO.D.010(a)(2)(iv) Composition of initial training — AREA CONTROL PROCEDURAL RATING (ACP) TRAINING — SUBJECT OBJECTIVES AND TRAINING OBJECTIVES

— AMC1 ATCO.D.010(a)(2)(v) Composition of initial training — APPROACH CONTROL SURVEILLANCE RATING (APS) TRAINING — SUBJECT OBJECTIVES AND TRAINING OBJECTIVES

— AMC1 ATCO.D.010(a)(2)(vi) Composition of initial training — AREA CONTROL SURVEILLANCE RATING (ACS) TRAINING — SUBJECT OBJECTIVES AND TRAINING OBJECTIVES

the following abbreviations apply:

Abbreviation	Meaning
A-RNP	Advanced Required Navigation Performance
A/B (Type)	A and B type approaches (classifications)
ABAS	Aircraft-based Augmentation System
ABES	Abnormal and Emergency Situations (Subject)
ACARS	Aircraft Communications Addressing and Reporting System
ACAS	Airborne Collision Avoidance System
ACC	Area Control Centre
ACFTB	Aircraft — Basic Training (subject)
ACFT	Aircraft (subject)
ACN	Aircraft Classification Number
ACP	Area Control Procedural Rating
ACS	Area Control Surveillance Rating
ADF	Automatic Direction Finding System
ADI	Aerodrome Control Instrument
ADS	Automatic Dependent Surveillance
ADS-B	Automatic Dependent Surveillance — Broadcast

ADS-C	Automatic Dependent Surveillance — Contract
ADV	Aerodrome Control Visual Rating
ADVS	Advisory Service
AEA	Association of European Airlines
AFIL	Air Filed Flight Plan
AFTN	Aeronautical fixed telecommunication network
AGA	Aerodromes
AIC	Aeronautical Information Circular
AIP	Aeronautical Information Publication
AIRAC	Aeronautical Information Regulation and Control
AIRAC SUP	AIRAC Supplement
AIREP	Air-Report
AIRMET	Information concerning en-route weather phenomena which may affect the safety of low-level aircraft operations
AIS	Aeronautical Information Service
ALRS	Alerting Service
AMC	Acceptable Means of Compliance
ANS	Air Navigation Services
AP/FD	Autopilot/Flight Director
APM	Approach Path Monitor
APP	Approach Control/Centre/Procedural Rating
APS	Approach Control Surveillance Rating
APV	Approach Procedure with Vertical guidance
APW	Area Proximity Warning
ASDA	Accelerate Stop Distance Available
ASM	Airspace Management
ASMGCS	Advanced Surface Movement Guidance and Control Systems
ATC	Air Traffic Control
ATCEUC	Air Traffic Controllers European Unions Coordination
ATCO	Air Traffic Controller
ATCS	Air Traffic Control Service
ATFCM	Air Traffic Flow and Capacity Management
ATFM	Air Traffic Flow Management
ATIS	Automatic Terminal Information Service

ATM	Air Traffic Management
ATMB	Air Traffic Management — Basic Training (subject)
ATS	Air Traffic Services
ATZ	Aerodrome Traffic Zone
AVASI	Advanced Visual Approach Slope Indicator
Beidou	Chinese Navigation Satellite System
BIRDTAM	Bird hazard NOTAM (NOTAM reporting bird hazard)
CANSO	Civil Air Navigation Services Organisation
CAT	Clear-Air Turbulence
CBA	Cross Border Area
CBT	Computer-Based Training
CCO	Continuous Climb Operations
CDO	Continuous Descent Operations
CDR	Conditional Route
CEM	Collaborative Environmental Management
CISM	Critical Incident Stress Management
CPDLC	Controller Pilot Data Link Communications
CPL	Current Flight Plan
CWP	Controller Working Position
DA	Decision Altitude
DFTI	Distance from Touchdown Indicator
DH	Decision Height
DMAN	Departure Manager
DME	Distance Measuring Equipment
Doc	Document
EASA	European Aviation Safety Agency
EAT	Expected Approach Time
EATCHIP	European Air Traffic Control Harmonisation and Integration Programme
EATMP	European Air Traffic Management Programme
EC	European Commission
ECAC	European Civil Aviation Conference
EET	Estimated Elapsed Time
EFIS	Electronic Flight Instrument System
EGNOS	European Geostationary Navigation Overlay Service

EGPWS	Enhanced Ground Proximity Warning System
EQPS	Equipment and Systems (subject)
EQPSB	Equipment and Systems — Basic Training (subject)
ETF	European Transport Workers' Federation
EU	European Union
EU ETS	European Union Emissions Trading Scheme
EUROCONTROL	European Organisation for the Safety of Air Navigation
FA	Fix to Altitude
FAB	Functional Airspace Block
FAF	Final Approach Fix
FAP	Final Approach Point
FDPS	Flight Data Processing System
FIR	Flight Information Region
FIS	Flight Information Service
FMS	Flight Management System
FPB	Flight Progress Board
FPL	Flight Plan
FRA	Free Route Airspace
FRT	Fixed Radius Transition
FTE	Flight Technical Error
FUA	Flexible Use of Airspace
Galileo	European Satellite Navigation System
GBAS	Ground-Based Augmentation System
GLONASS	Global Orbiting Navigation Satellite System
GNSS	Global Navigation Satellite System
GP	Glide Path
GPS	Global Positioning System
GPWS	Ground Proximity Warning System
HF	High Frequency
HFACS	Human Factors Analysis & Classification System
HUM	Human Factors (subject)
HUMB	Human Factors — Basic Training (subject)
IACA	International Air Carrier Association
IAF	Initial Approach Fix

IAOPA	International Council of Aircraft Owner and Pilot Associations
IATA	International Air Transport Association
ICAO	International Civil Aviation Organisations
IF	Intermediate Approach Fix
IFALPA	International Federation of Airline Pilots' Associations
IFATCA	International Federation of Air Traffic Controllers' Associations
IFPS	Integrated Initial Flight Plan Processing System
IFR	Instrument Flight Rules
ILS	Instrument Landing System
IMC	Instrument Meteorological Conditions
INS	Inertial Navigation System
INTR	Introduction to the course (subject)
INTRB	Introduction to the course — Basic Training (subject)
IRS	Inertial Reference System
IRVR	Instrument Runway Visual Range
ISA	International Standard Atmosphere
ITU	International Telecommunications Union
LAM	Local Area Multilateration
LAW	Aviation Law (subject)
LAWB	Aviation Law — Basic Training (subject)
LDA	Landing Distance Available
locLNAV	Lateral Navigation
LOA	Letter of Agreement
LOC	Localiser
LOPs	Local Operating Procedures
LPV	Localiser Performance with Vertical guidance
MAPt	Missed Approach Point
MCMF	Multi-Constellation, Multi-Frequency
MDA	Minimum Descent Altitude
MDH	Minimum Descent Height
MET	Meteorology
METAR	Meteorological Aviation Routine Weather Report
METB	Meteorology — Basic Training (subject)
MLAT	Multilateration

Mode A	SSR identification code
Mode C	SSR Mode C (Pronounced: Mode Charlie)
Mode S	Mode Select
MSAW	Minimum Safe Altitude Warning
MTCD	Medium Term Conflict Detection
MWO	Meteorological Watch Office
NAV	Navigation (subject)
NAVAID	Navigation(al) Aid
NAVB	Navigation — Basic Training (subject)
NDB	Non-Directional Beacon
No.	Number
NOTAM	Notice to Airmen
NPA	Non-Precision Approach
NSE	Navigation System Error
OCA	Obstacle Clearance Altitude
OCH	Obstacle Clearance Height
OJT	On-the-Job Training
OLDI	On-Line Data Interchange
PA	Precision Approach
PANS	Procedures for Air Navigation Services
PAPI	Precision Approach Path Indicator
PAR	Precision Approach Radar
PBN	Performance Based Navigation
PCN	Pavement Classification Number
PCP IR	Pilot Common Project Implementing Rule
PDE	Path Definition Error
PEAR (model)	People who do the job/Environment in which they work/Actions they perform/Resources necessary to complete the job
PEN	Professional Environment (subject)
PENB	Professional Environment — Basic Training (subject)
PSR	Primary Surveillance Radar
PTP	Part-Time Practice
QDM	Inbound magnetic bearing to the station
QDR	Outbound magnetic bearing from the station
QFE	Atmospheric pressure at aerodrome elevation

QNH	Atmospheric pressure at mean sea level
QTF	The position of the transmitting station according to the bearings taken by the D/F station
RA	Resolution Advisory (TCAS)
RAIM	Receiver Autonomous Integrity Monitoring
RCC	Rescue Coordination Centre
RF	Radius to Fix
RNAV	Area Navigation
RNP	Required Navigation Performance
RNP APCH	Required Navigation Performance Approach
RNP AR APCH	Required Navigation Performance Authorisation Required Approach
RNP (AR) DEP	Required Navigation Performance Authorisation Required Departure
ROC	Rate of Climb
RPAS	Remotely Piloted Aircraft System
RPL	Stored Flight Plan
RTF	Radiotelephony
RVR	Runway Visual Range
RVSM	Reduced Vertical Separation Minimum
SADIS	Satellite Distribution of World Area Forecast System
SAR	Search and Rescue
SARPs	Standards and Recommended Practices (ICAO)
SBAS	Satellite Based Augmentation System
SDPS	Surveillance Data Processing System
SELCAL	Selective Calling
SES	Single European Sky
SHELL (model)	Software, Hardware, Environment, Live ware, Live ware Model
SIB	Safety Information Bulletin
SID	Standard Instrument Departure (Route)
SIGMET	Significant Meteorological Information
SMAN	Surface Management
SMR	Surface Movement Radar
SNOWTAM	NOTAM on SNOW conditions
SOPs	Standard Operating Procedures
SPECI	Aviation Selected Special Weather Report
SSR	Secondary Surveillance Radar

STAR	Standard Instrument Arrival (Route)
STCA	Short Term Conflict Alert
SVFR	Special Visual Flight Rules
TA	Traffic Alert (TCAS)
TACAN	UHF Tactical Air Navigation Aid
TAF	Terminal Area (Aerodrome) Forecast
TAWS	Terrain Awareness and Warning System
TBO	Trajectory-Based Operations
TCAC	Tropical Cyclone Advisory Centre
TCAS	Traffic Alert and Collision Avoidance System
TODA	Take-Off Distance Available
TORA	Take-Off Run Available
TRM	Team Resource Management
TSA	Temporary Segregated Area
TSE	Total System Error
TWR	Tower Control Unit (Aerodrome Control Tower)
UAS	Unmanned Aircraft System
UDF	Ultra High Frequency Direction Finder
UHF	Ultra High Frequency
UTC	Coordinated Universal Time
VAAC	Volcanic Ash Advisory Centre
VASI	Visual Approach Slope Indicator
VDF	Very High Frequency Direction Finder
VFR	Visual Flight Rules
VHF	Very High Frequency
VMC	Visual Meteorological Conditions
VNAV	Vertical Navigation
VOLMET	Routine Weather Reports Broadcast on VHF
VOR	VHF Omni-directional Radio Range
WAFC	World Area Forecast Centre
WAFS	World Area Forecast System
WAM	Wide Area Multilateration
WGS-84	World Geodetic System 84
WMO	World Meteorological Organization

AMC1 ATCO.D.010(a)(1) Composition of initial training

BASIC TRAINING — SUBJECT OBJECTIVES AND TRAINING OBJECTIVES

(a) The general principles that apply to this AMC are contained in AMC1 ATCO.D.010(a).

(b) Basic training should contain the following subject objectives and training objectives that are associated with the subjects, topics and subtopics contained in Appendix 2 to TCAR PEL Part ATCO.

(c) Subjects, topics and subtopics from Appendix 2 to TCAR PEL Part ATCO are repeated in this AMC for the convenience of the reader and do not form part of it.

SUBJECT 1: INTRODUCTION TO THE COURSE

The subject objective is:

Learners shall know and understand the training programme that they will follow and how to obtain the appropriate information, and recognise the potential for development of their careers in ATC.

TOPIC INTRB 1 — COURSE MANAGEMENT			
Subtopic INTRB 1.1 — Course introduction			
BASIC INTRB 1.1.1	Explain the aims and main objectives of the course.	2	
Subtopic INTRB 1.2 — Course administration			
BASIC INTRB 1.2.1	State how the course is administered.	1	
Subtopic INTRB 1.3 — Study material and training documentation			
BASIC INTRB 1.3.1	Use appropriate documents and their sources for the course.	3	*Optional content: training documentation, library, CBT library, web, learning management server*
BASIC INTRB 1.3.2	Integrate appropriate information into course studies.	4	Training documentation *Optional content: supplementary information, library*

TOPIC INTRB 2 — INTRODUCTION TO THE ATC TRAINING COURSE			
Subtopic INTRB 2.1 — Course content and organisation			
BASIC INTRB 2.1.1	State the different training methods used during the course.	1	Theoretical training, practical training, self-study, types of training events
BASIC INTRB 2.1.2	State the subjects covered by the course and their purpose.	1	
BASIC INTRB 2.1.3	Describe the organisation of theoretical training.	2	*Optional content: course programme*
BASIC INTRB 2.1.4	Describe the organisation of practical training.	2	*Optional content: PTP, simulation, briefing, debriefing, course programme*

Subtopic INTRB 2.2 — Training ethos			
BASIC INTRB 2.2.1	Recognise the feedback mechanisms available.	1	*Optional content: instructor discussions, training progress, assessment, examinations, results, briefing, debriefing*
BASIC INTRB 2.2.2	Describe the positive effect of working and learning together with course participants.	2	Teamwork in theoretical and practical training
Subtopic INTRB 2.3 — Assessment process			
BASIC INTRB 2.3.1	Describe the assessment process.	2	

TOPIC INTRB 3 — INTRODUCTION TO THE ATCO's FUTURE			
Subtopic INTRB 3.1 — Job prospects			
BASIC INTRB 3.1.1	Recognise an ATCO's working environment.	1	Area control unit, approach control unit, aerodrome control unit
BASIC INTRB 3.1.2	Recognise career developments.	1	*Optional content: OJT instructor, supervisor, operational managerial posts, non-operational posts*

SUBJECT 2 : AVIATION LAW

The subject objective is:

Learners shall apply the regulations governing the rules of the air, airspace and flight planning and explain their development or, where applicable, their incorporation into national legislation.

TOPIC LAWB 1 — INTRODUCTION TO AVIATION LAW			
Subtopic LAWB 1.1 — Relevance of aviation law			
BASIC LAWB 1.1.1	State the necessity for air law, the sources and development of aviation law.	1	Relevant legislation, ICAO Convention *Optional content: ICAO Annex 2, national aviation law*
BASIC LAWB 1.1.2	Name the key national and international aviation organisations.	1	*Optional content: ICAO and national authority*
BASIC LAWB 1.1.3	Describe the impact these organisations have on ATC and their interaction with each other.	2	

TOPIC LAWB 2 — INTERNATIONAL ORGANISATIONS			
Subtopic LAWB 2.1 — ICAO			
BASIC LAWB 2.1.1	Explain the purpose and function of ICAO.	2	
BASIC LAWB 2.1.2	Describe the methods by which ICAO notifies and implements legislation.	2	SARPs, PANS, ICAO annexes, ICAO documents *Optional content: regional offices*
Subtopic LAWB 2.2 —Other authority and agencies			
BASIC LAWB 2.2.1	Explain the purpose and functions of other agencies	2	Network Manager function
BASIC LAWB 2.2.2	Explain the purpose and functions of other authorities	2	
BASIC LAWB 2.2.3	State the purpose and function of other international agencies and their relevance to air traffic operations.	1	*Optional content: ECAC, EU, ITU, CANSO, WMO*
Subtopic LAWB 2.3 — Aviation associations			
BASIC LAWB 2.3.1	State the purpose of controller, pilot, airline and airspace user associations and their interaction with ATC.	1	*Optional content: IFATCA, IFALPA, IATA, AEA, IAOPA, IACA, military services, ETF, ATCEUC*

TOPIC LAWB 3 — NATIONAL ORGANISATIONS			
Subtopic LAWB 3.1 — Purpose and function			
BASIC LAWB 3.1.1	Describe the purpose and function of appropriate national agencies and their relevance to air traffic operations.	2	*Optional content: civil aviation administration agencies, government agencies*
Subtopic LAWB 3.2 — National legislative procedures			
BASIC LAWB 3.2.1	Describe the means by which legislation is implemented, notified and updated.	2	ICAO Annex 15 *Optional content: AIS, AIPs, AIRAC, SUPs, AICs, NOTAMs, integrated aeronautical*
BASIC LAWB 3.2.2	Recognise the information contained in the different parts of the AIP.	1	
Subtopic LAWB 3.3 — Competent authority			
BASIC LAWB 3.3.1	Name the competent authority responsible for licensing and enforcing legislation and operational procedures.	1	
BASIC LAWB 3.3.2	Describe how the competent authority carries out its safety regulation responsibilities.	2	
Subtopic LAWB 3.4 — National aviation associations			
BASIC LAWB 3.4.1	State the purpose of national controller, pilot, airline and airspace user associations.	1	*Optional content: THAIPA*

TOPIC LAWB 4 — ATS SAFETY MANAGEMENT			
Subtopic LAWB 4.1 — Safety regulation			
BASIC LAWB 4.1.1	Describe the need for safety regulation.	2	National regulations *Optional content: State Safety Programme (SSP)*
BASIC LAWB 4.1.2	Describe the general principles of the safety organisation.	2	Safety regulation *Optional content: National regulations*
BASIC LAWB 4.1.3	Explain the impact of safety regulation on the controller.	2	*Optional content: Regulation relevant to ATCO licensing*
Subtopic LAWB 4.2 — Safety management system			
BASIC LAWB 4.2.1	Explain the regulatory requirements of safety management systems in ATM.	2	
BASIC LAWB 4.2.2	Explain the principles of the safety management systems.	2	
BASIC LAWB 4.2.3	Describe the safety assessment methodology.	2	*Optional content: Air navigation system safety assessment methodology, national regulations*

TOPIC LAWB 5 — RULES AND REGULATIONS			
Subtopic LAWB 5.1 — Units of measurement			
BASIC LAWB 5.1.1	Describe the units of measurement used in aviation.	2	ICAO Annex 5
Subtopic LAWB 5.2 — ATCO licensing/certification			
BASIC LAWB 5.2.1	Explain the ATCO licensing/certification process.	2	National regulation on ATCO Licensing, Approved training courses; ATCO licences, ratings and endorsements *Optional content: national processes*
BASIC LAWB 5.2.2	Explain the privileges and limitations of controller licences.	2	National regulation on ATCO privileges and limitations
Subtopic LAWB 5.3 — Overview of ANS and ATS			
BASIC LAWB 5.3.1	Differentiate between the Air Navigation Services.	2	
BASIC LAWB 5.3.2	Explain the considerations which determine the need for the ATS.	2	ICAO Annex 11
BASIC LAWB 5.3.3	Differentiate between the ATS.	2	ATCS, ADVS, FIS, ALRS
BASIC LAWB 5.3.4	Explain the objectives of ATS.	2	ICAO Annex 11
Subtopic LAWB 5.4 — Rules of the air			
BASIC LAWB 5.4.1	Explain the rules of the air.	2	ICAO Annex 2 and Regulation of Civil Aviation Board No.94
BASIC LAWB 5.4.2	State any notified differences with ICAO.	1	*Optional content: Supplements to ICAO Annex 2, ICAO Annex 11 and ICAO Doc. 10055*
BASIC LAWB 5.4.3	Appreciate the influence of relevant flight rules on ATC.	3	General flight rules, instrument flight rules, visual flight rules

TOPIC LAWB 5 — RULES AND REGULATIONS			
BASIC LAWB 5.4.4	Appreciate the differences between flying in accordance with VFR and IFR, in VMC and IMC.	3	ICAO Annex 2 and Regulation of Civil Aviation Board No.94
Subtopic LAWB 5.5 — Airspace and ATS routes			
BASIC LAWB 5.5.1	Explain airspace classification.	2	ICAO Annex 11 and Regulation of Civil Aviation Board No.94
BASIC LAWB 5.5.2	Differentiate between the different types of airspace.	2	*Optional content: control zones, control areas, airways, upper and lower airspace, restricted areas, prohibited and danger areas, FIR, aerodrome traffic zone, etc.*
BASIC LAWB 5.5.3	Differentiate between the different types of ATS routes.	2	Airway, arrival route, departure route, advisory route, controlled route, uncontrolled route, etc.
BASIC LAWB 5.5.4	Decode information from aeronautical charts.	3	*Optional content: control zones, control areas, ATS routes, upper and lower airspace, restricted areas, prohibited and danger areas, FIR, aerodrome traffic zone, etc.*
Subtopic LAWB 5.6 — Flight plan			
BASIC LAWB 5.6.1	Explain the functions of a flight plan.	2	ICAO Annex 2 and ICAO Doc 4444
BASIC LAWB 5.6.2	Explain the different types of flight plans and associated update messages.	2	ICAO Doc 4444
BASIC LAWB 5.6.3	Explain the pilot's responsibilities in relation to adherence to flight plan.	2	ICAO Annex 2 and Inadvertent changes, intended changes, position reporting
BASIC LAWB 5.6.4	Describe flight plan processing.	2	*Optional content: AFTN, IFPS*
Subtopic LAWB 5.7 — Aerodromes			
BASIC LAWB 5.7.1	Describe the general design and layout of an aerodrome.	2	Runway(s), taxiways, apron, movement area, manoeuvring area, designated positions on an aerodrome
BASIC LAWB 5.7.2	Explain the numbering system and orientation of runways.	2	ICAO Annex 14
BASIC LAWB 5.7.3	Differentiate between different types of aerodromes.	2	Controlled, uncontrolled *Optional content: military, international, regional*
BASIC LAWB 5.7.4	Describe designated positions in the traffic circuit.	2	ICAO Doc 4444
BASIC LAWB 5.7.5	List the factors affecting the selection of runway in use.	1	ICAO Doc 4444

Subtopic LAWB 5.8 — Holding procedures for IFR flights			
BASIC LAWB 5.8.1	Describe the purpose of holding.	2	Traffic management, weather, pilot request, ICAO Doc 4444, ICAO Doc 8168
BASIC LAWB 5.8.2	Describe the types of holding patterns.	2	Published, non-published
BASIC LAWB 5.8.3	Describe an ICAO holding pattern.	2	ICAO Doc 8168 — Parts of an IFR holding pattern, entry/exit procedures, dimensions of patterns, protected airspace, holding areas, alignment, rates of turns, holding times, expect further clearance, Expected Approach Times (EATs)
BASIC LAWB 5.8.4	Describe the factors affecting the holding pattern.	2	Effect of speed, effect of level used, effect of navigation aid in use, turbulence
Subtopic LAWB 5.9 — Holding procedures for VFR flights			
BASIC LAWB 5.9.1	Describe VFR holding.	2	

SUBJECT 3: AIR TRAFFIC MANAGEMENT

The subject objective is:

Learners shall describe the basic principles of air traffic management and apply basic operational procedures.

TOPIC ATMB 1 — AIR TRAFFIC MANAGEMENT			
Subtopic ATMB 1.1 — Application of units of measurement			
BASIC ATMB 1.1.1	Apply the units of measurement appropriate to ATM.	3	
Subtopic ATMB 1.2 — Air traffic control (ATC) service			
BASIC ATMB 1.2.1	Define ATC service.	1	ICAO Annex 11
BASIC ATMB 1.2.2	Explain the division of the ATC service.	2	ICAO Annex 11
BASIC ATMB 1.2.3	Explain the responsibility for the provision of the ATC service.	2	ICAO Annex 11
BASIC ATMB 1.2.4	Differentiate between the different methods of providing ATC services.	2	Aerodrome, surveillance, procedural
Subtopic ATMB 1.3 — Flight information service (FIS)			
BASIC ATMB 1.3.1	Define FIS.	1	ICAO Annex 11
BASIC ATMB 1.3.2	Describe the scope of the FIS.	2	ICAO Annex 11
BASIC ATMB 1.3.3	Explain the responsibility for the provision of the FIS.	2	ICAO Doc 4444
BASIC ATMB 1.3.4	State the methods of transmitting information.	1	*Optional content: RTF, data link, ATIS, VOLMET, etc.*
BASIC ATMB 1.3.5	List the content of ATIS and VOLMET.	1	ICAO Annex 3 *Optional content: meteorological data obtained by data link*
BASIC ATMB 1.3.6	Issue information to aircraft.	3	*Optional content: SIGMET, serviceability of navaids, weather, flight safety information, essential traffic, essential local traffic, information related to aerodrome conditions, etc.*

TOPIC ATMB 1 — AIR TRAFFIC MANAGEMENT			
Subtopic ATMB 1.4 — Alerting service			
BASIC ATMB 1.4.1	Define ALRS.	1	ICAO Annex 11
BASIC ATMB 1.4.3	Explain the responsibility for the provision of the ALRS.	2	ICAO Doc 4444,
BASIC ATMB 1.4.4	Differentiate between the phases of emergency.	2	Uncertainty, alert, distress
BASIC ATMB 1.4.5	Describe the organisation of an ALRS.	2	Responsibilities, local organisation
BASIC ATMB 1.4.6	Describe the cooperation between units providing the alerting services and the SAR units.	2	
BASIC ATMB 1.4.7	Differentiate between distress and urgency signals.	2	Mayday, Pan Pan, Pan Pan Medical *Optional content: visual signals, etc.*
BASIC ATMB 1.5.1	Define air traffic advisory service.	1	ICAO Annex 11
BASIC ATMB 1.5.2	Describe the scope of the air traffic advisory service.	2	ICAO Doc 4444
BASIC ATMB 1.5.3	Explain the responsibility for the provision of the air traffic advisory service.	2	ICAO Doc 4444
BASIC ATMB 1.5.4	State to which flights air traffic advisory service shall be provided.	1	ICAO Doc 4444
BASIC ATMB 1.6.1	Define ATFM.	1	ICAO Annex 11 and ICAO Doc 4444
BASIC ATMB 1.6.2	State the scope of capacity management.	1	ICAO Annex 11 and ICAO Doc 4444
BASIC ATMB 1.6.3	Describe the scope of air traffic flow capacity management (ATFCM).	2	ICAO Annex 11 and ICAO Doc 4444
BASIC ATMB 1.6.4	Explain the responsibility for the provision of ATFCM.	2	ICAO Annex 11 and ICAO Doc 4444
BASIC ATMB 1.6.5	Explain the methods of providing ATFCM.	2	ICAO Annex 11 and ICAO Doc 4444

TOPIC ATMB 1 — AIR TRAFFIC MANAGEMENT			
Subtopic ATMB 1.7 — Airspace management (ASM)			
BASIC ATMB 1.7.1	Define ASM.	1	ICAO Annex 11
BASIC ATMB 1.7.2	Describe the scope of ASM.	2	ICAO Annex 11
BASIC ATMB 1.7.3	Explain the responsibility for the provision of ASM.	2	ICAO Annex 11
BASIC ATMB 1.7.4	Explain the methods of managing airspace.	2	ICAO Annex 11

TOPIC ATMB 2 — ALTIMETRY AND LEVEL ALLOCATION			
Subtopic ATMB 2.1 — Altimetry			
BASIC ATMB 2.1.1	Appreciate the relationship between height, altitude and flight level.	3	QFE, QNH, standard pressure
Subtopic ATMB 2.2 — Transition level			
BASIC ATMB 2.2.1	Appreciate the relationship between transition level, transition altitude and transition layer.	3	ICAO Doc 4444 *Optional content: ICAO Doc 8168*
BASIC ATMB 2.2.2	Calculate the appropriate levels.	3	*Optional content: transition level, transition layer, height, lowest useable flight level, vertical distance to airspace boundaries*
Subtopic ATMB 2.3 — Level allocation			
BASIC ATMB 2.3.1	Describe the cruising level allocation system.	2	ICAO Annex 2
BASIC ATMB 2.3.2	Choose the appropriate levels.	3	Flight levels, altitudes, heights

TOPIC ATMB 3 — RADIOTELEPHONY (RTF)			
Subtopic ATMB 3.1 — RTF general operating procedures			
BASIC ATMB 3.1.1	Explain the need for approved phraseology.	2	
BASIC ATMB 3.1.2	Use approved phraseology.	3	ICAO Doc 4444 and ICAO Doc 9432
BASIC ATMB 3.1.3	Perform communication effectively.	3	Communication techniques, readback/verification of readback

TOPIC ATMB 4 — ATC CLEARANCES AND ATC INSTRUCTIONS			
Subtopic ATMB 4.1 — Type and content of ATC clearances			
BASIC ATMB 4.1.1	Define ATC clearance.	1	ICAO Annex 2 and ICAO Doc 4444
BASIC ATMB 4.1.2	Describe the contents of an ATC clearance.	2	ICAO Annex 2 and ICAO Doc 4444
BASIC ATMB 4.1.3	Issue appropriate ATC clearances.	3	ICAO Annex 2 and ICAO Doc 4444
Subtopic ATMB 4.2 — ATC instructions			
BASIC ATMB 4.2.1	Define ATC Instructions.	1	ICAO Annex 2 and ICAO Doc 4444
BASIC ATMB 4.2.2	Describe the contents of an ATC instruction.	2	ICAO Annex 2 and ICAO Doc 4444
BASIC ATMB 4.2.3	Issue appropriate ATC instructions.	3	ICAO Annex 2 and ICAO Doc 4444 *Optional content: national documents*

TOPIC ATMB 5 — COORDINATION			
Subtopic ATMB 5.1 — Principles, types and content of coordination			
BASIC ATMB 5.1.1	Explain the principles, types and content of coordination.	2	ICAO Doc 4444, ICAO Annex 11 and ICAO Annex 2 *Optional content: notification, negotiation, agreement, transfer of flight data and local agreements, etc.*
Subtopic ATMB 5.2 — Necessity for coordination			
BASIC ATMB 5.2.1	Appreciate the need for coordination.	3	ICAO Doc 4444
BASIC ATMB 5.2.2	Differentiate between transfer of control and transfer of communication procedures.	2	ICAO Doc 4444
Subtopic ATMB 5.3 — Means of coordination			
BASIC ATMB 5.3.1	Describe the means of coordination.	2	*Optional content: data link, telephone, intercom, voice, etc.*
BASIC ATMB 5.3.2	Use the available means for coordination.	3	

TOPIC ATMB 6 — DATA DISPLAY			
Subtopic ATMB 6.1 — Data extraction			
BASIC ATMB 6.1.1	Encode and decode an appropriate selection of standard ICAO abbreviations.	3	*Optional content: ICAO Doc 8585, ICAO Doc 8643, ICAO Doc 7910*
BASIC ATMB 6.1.2	Extract pertinent data from relevant sources to produce a flight progress display.	3	Pilot reports, coordination, data exchange *Optional content: flight plan*
BASIC ATMB 6.1.3	Encode and decode flight plans (including supplementary information).	3	ICAO format, AFTN format
Subtopic ATMB 6.2 — Data management			
BASIC ATMB 6.2.1	Update the situation display to accurately reflect the traffic situation.	3	*Optional content: strip marking symbols, strip movement procedures, electronic data, label*

TOPIC ATMB 7 — SEPARATIONS			
Subtopic ATMB 7.1 — Vertical separation and procedures			
BASIC ATMB 7.1.1	State the vertical separation standards.	1	ICAO Doc 4444
BASIC ATMB 7.1.2	Explain the vertical separation procedures.	2	ICAO Doc 4444
Subtopic ATMB 7.2 — Horizontal separation and procedures			
BASIC ATMB 7.2.1	State the principles of longitudinal separation procedures based on time and distance.	1	ICAO Doc 4444
BASIC ATMB 7.2.2	State the principles of lateral separation procedures.	1	ICAO Doc 4444
Subtopic ATMB 7.3 — Visual separation			
BASIC ATMB 7.3.1	State the occasions when clearance to fly by maintaining own separation while in VMC can be used.	1	
Subtopic ATMB 7.4 — Aerodrome separation and procedures			
BASIC ATMB 7.4.1	State the aerodrome separation standards.	1	Separation on the manoeuvring area, in the traffic circuit, for departing and arriving aircraft
BASIC ATMB 7.4.2	Explain the aerodrome separation procedures.	2	ICAO Doc 4444
BASIC ATMB 7.4.3	Define essential local traffic.	1	ICAO Doc 4444
Subtopic ATMB 7.5 — Separation based on ATS surveillance systems			
BASIC ATMB 7.5.1	Explain the use of ATS surveillance systems in ATS.	2	Separation, identification, monitoring, vectoring, expedition and assistance to traffic *Optional content: ICAO Doc 4444*

BASIC ATMB 7.5.2	Explain the ATS surveillance systems separation standards and procedures.	2	ICAO Doc 4444
Subtopic ATMB 7.6 — Wake turbulence separation			
BASIC ATMB 7.6.1	Explain the wake turbulence separations.	2	ICAO Doc 4444,

TOPIC ATMB 8 — AIRBORNE COLLISION AVOIDANCE SYSTEMS AND GROUND-BASED SAFETY NETS			
Subtopic ATMB 8.1 — Airborne collision avoidance systems			
BASIC ATMB 8.1.1	State the requirement for carriage of airborne collision avoidance system.	1	Relevant national regulations
BASIC ATMB 8.1.2	Explain the main characteristics of airborne warning systems and their relevance to ATC operations.	2	ACAS, TAWS *Optional content: TCAS, EGPWS, wind shear alerts*
BASIC ATMB 8.1.3	Explain the function of ACAS Traffic Alerts and Resolution Advisories.	2	ICAO Doc 8168
BASIC ATMB 8.1.4	List the actions of the pilot in case of TA and RA.	1	ICAO Doc 8168
BASIC ATMB 8.1.5	List the ACAS limitations.	1	ICAO Doc 9863
Subtopic ATMB 8.2 — Ground-based safety nets			
BASIC ATMB 8.2.1	Explain the main characteristics of ground-based safety nets and their relevance to ATC operations.	2	*Optional content: STCA, MSAW, APW, APM*

TOPIC ATMB 9 — BASIC PRACTICAL SKILLS			
Subtopic ATMB 9.1 — Traffic management process			
BASIC ATMB 9.1.1	Consider human information-processing in the provision of ATC.	2	Situational awareness, conflict detection, planning, decision-making, prioritisation, execution
BASIC ATMB 9.1.2	Consider the need for verification that actions are carried out.	2	Monitoring
Subtopic ATMB 9.2 — Basic practical skills applicable to all ratings			
BASIC ATMB 9.2.1	Verify that the settings of the working position are appropriate.	3	
BASIC ATMB 9.2.2	Operate the available working position equipment.	3	

BASIC ATMB 9.2.3	Maintain situational awareness by monitoring traffic.	3	Information gathering, scanning, planning
BASIC ATMB 9.2.4	Appreciate priority of actions.	3	
BASIC ATMB 9.2.5	Execute selected plan.	3	
BASIC ATMB 9.2.6	Apply the prescribed procedures for the area of responsibility.	3	*Optional content: LOPs, transfer of control and communication, level allocation, inbound and outbound procedures*
BASIC ATMB 9.2.7	Appreciate relative velocity between aircraft.	3	
BASIC ATMB 9.2.8	Identify separation problems.	3	
BASIC ATMB 9.2.9	Choose the appropriate separation methods.	3	
BASIC ATMB 9.2.10	Apply separation.	3	*Optional content: vertical, longitudinal, lateral, aerodrome, based on ATS surveillance systems, distances from airspace boundaries*
Subtopic ATMB 9.3 — Basic practical skills applicable to aerodrome			
BASIC ATMB 9.3.1	Perform the basic functions of aerodrome control.	3	
BASIC ATMB 9.3.2	Perform the control of aerodrome traffic.	3	Single runway operations including VFR and IFR traffic
Subtopic ATMB 9.4 — Basic practical skills applicable to surveillance			
BASIC ATMB 9.4.1	Explain the methods and procedures of establishing identification.	2	ICAO Doc 4444
BASIC ATMB 9.4.2	Apply the procedures for establishing identification.	3	Any of the ATS surveillance systems identification methods
BASIC ATMB 9.4.3	Estimate the heading for a new track and the distance to the next waypoint.	3	
BASIC ATMB 9.4.4	Apply vectoring techniques.	3	
BASIC ATMB 9.4.5	Conduct level changes.	3	*Optional content: cruising level allocation, requested level change, climb/descent to exit level, descent to an altitude or a height*

SUBJECT 4: METEOROLOGY

The subject objective is:

Learners shall describe how meteorology affects ATS operations and aircraft performance, and apply meteorological information in the basic operational procedures of ATS.

TOPIC METB 1 — INTRODUCTION TO METEOROLOGY			
Subtopic METB 1.1 — Application of units of measurement			
BASIC METB 1.1.1	Apply the units of measurement appropriate to meteorology.	3	
Subtopic METB 1.2 — Aviation and meteorology			
BASIC METB 1.2.1	Explain the relevance of meteorology in aviation.	2	
BASIC METB 1.2.2	Explain the requirements for the provision of meteorological information available to operators, flight crew members, and to air traffic services.	2	*Optional content: ICAO Annex 3, ICAO Annex 11*
BASIC METB 1.2.3	State the meteorological hazards to aviation.	1	Turbulence, thunderstorms, icing, micro bursts, squall, macro burst, wind shear, volcanic ash
Subtopic METB 1.3 — Organisation of meteorological service			
BASIC METB 1.3.1	Name the basic duties, organisation and working methods of meteorological offices.	1	*Optional content: WAFS, WAFC, MWO, VAAC, TCAC, SADIS*
BASIC METB 1.3.2	State the international and national standards for coordination between ATS and MET services.	1	

TOPIC METB 2 — ATMOSPHERE			
Subtopic METB 2.1 — Composition and structure			
BASIC METB 2.1.1	State the composition and structure of the atmosphere.	1	Gases, layers
BASIC METB 2.1.2	Describe the basic characteristics of the atmospheric parameters measured.	2	Temperature, pressure, wind, humidity, density
BASIC METB 2.1.3	List the tools used for the collection of meteorological data.	1	*Optional content: barometer, thermometer, ceilometer, anemometer, weather balloons, transmissometer, radar, satellites, etc.*
Subtopic METB 2.2 — Standard atmosphere			
BASIC METB 2.2.1	Describe the elements of the ISA.	2	Temperature, pressure, density
BASIC METB 2.2.2	State the reasons why the ISA has been defined.	1	

Subtopic METB 2.3 — Heat and temperature			
BASIC METB 2.3.1	Define the processes by which heat is transferred and how the atmosphere is heated.	1	Radiation, convection, advection, conduction, water cycle
BASIC METB 2.3.2	Describe how temperature varies.	2	Adiabatic processes, lapse rates, stability, instability
BASIC METB 2.3.3	State the influencing factors on surface temperature.	1	
Subtopic METB 2.4 — Water in the atmosphere			
BASIC METB 2.4.1	Differentiate between the different processes related to atmospheric moisture.	2	Condensation, evaporation, sublimation, saturation
BASIC METB 2.4.2	Characterise relative humidity, dew point and latent heat.	2	
Subtopic METB 2.5 — Air pressure			
BASIC METB 2.5.1	Describe the relationship between pressure, temperature, density and height.	2	
BASIC METB 2.5.2	Explain the relationship between pressure settings.	2	QFE, QNH, standard pressure
BASIC METB 2.5.3	Explain the effect of air pressure and temperature on altimeter readings and the true altitude of aircraft.	2	
BASIC METB 2.5.4	State how atmospheric pressure is measured.	1	

TOPIC METB 3 — ATMOSPHERIC CIRCULATION			
Subtopic METB 3.1 — General air circulation			
BASIC METB 3.1.1	State the major atmospheric circulation features on the Earth.	1	*Optional content: Hadley cells, high and low belts, polar fronts, westerly winds, upper-level jet streams*
Subtopic METB 3.2 — Air masses and frontal systems			
BASIC METB 3.2.1	Describe the origin and movement of typical air masses and their general effect.	2	Polar, arctic, tropical, equatorial (maritime and continental)
BASIC METB 3.2.2	Describe the main isobaric features.	2	Cyclones, anticyclones, ridge, trough
BASIC METB 3.2.3	Describe the difference between various fronts and the associated weather.	2	Warm front, cold front, occluded front
Subtopic METB 3.3 — Mesoscale systems			
BASIC METB 3.3.1	Describe the main phenomena caused by mesoscale systems.	2	Mountain waves, slope and valley winds, thunderstorm, squall line

			Optional content: land/sea breezes, tornadoes, land spouts, waterspouts
BASIC METB 3.3.2	Explain the relevance of mesoscale systems to aviation.	2	
Subtopic METB 3.4 — Wind			
BASIC METB 3.4.1	Explain the significance of wind phenomena and types.	2	*Optional content: veering, backing, gusting, jet streams, land/sea breezes, surface, upper*
BASIC METB 3.4.2	State how wind is measured.	1	
BASIC METB 3.4.3	Explain the effect of forces which influence wind.	2	

TOPIC METB 4 — METEOROLOGICAL PHENOMENA			
Subtopic METB 4.1 — Clouds			
BASIC METB 4.1.1	Explain the different conditions for the formation of clouds.	2	
BASIC METB 4.1.2	Recognise different cloud types.	1	
BASIC METB 4.1.3	State the cloud types' main characteristics.	1	
BASIC METB 4.1.4	State how the cloud base and the amount of cloud are measured and/or observed.	1	
BASIC METB 4.1.5	Define cloud base and ceiling.	1	
BASIC METB 4.1.6	Differentiate between cloud base and ceiling.	2	
Subtopic METB 4.2 — Types of precipitation			
BASIC METB 4.2.1	Explain the significance of precipitation in aviation.	2	
BASIC METB 4.2.2	Describe types of precipitation and their corresponding cloud families.	2	*Optional content: rain, snow, snow grains, hail, ice pellets, ice crystals, drizzle*
Subtopic METB 4.3 — Visibility			
BASIC METB 4.3.1	Explain the causes of atmospheric obscurity.	2	
BASIC METB 4.3.2	Differentiate between different types of visibility.	2	Horizontal visibility, slant visibility, prevailing visibility, RVR

BASIC METB 4.3.3	State how visibility is measured.	1	
BASIC METB 4.3.4	Explain the significance of visibility in aviation.	2	
Subtopic METB 4.4 — Meteorological hazards			
BASIC METB 4.4.1	Explain the meteorological hazards to aviation.	2	Turbulence, icing, micro bursts, macro burst, wind shear, thunderstorms, volcanic ash *Optional content: squall*
BASIC METB 4.4.2	Describe the effect of meteorological hazards on aviation.	2	
TOPIC METB 5 — METEOROLOGICAL INFORMATION FOR AVIATION			
Subtopic METB 5.1 — Messages and reports			
BASIC METB 5.1.1	Decode the content of weather reports and forecasts.	3	METAR, SPECI, TAF, SIGMET *Optional content: local reports*

SUBJECT 5: NAVIGATION

The subject objective is:

Learners shall explain the basic principles of navigation and use this knowledge in ATS operations.

TOPIC NAVB 1 — INTRODUCTION TO NAVIGATION			
Subtopic NAVB 1.1 — Application of units of measurement			
BASIC NAVB 1.1.1	Apply the units of measurement appropriate to navigation.	3	
Subtopic NAVB 1.2 — Purpose and use of navigation			
BASIC NAVB 1.2.1	Explain the need for navigation in aviation.	2	
BASIC NAVB 1.2.2	Characterise navigation methods.	2	*Optional content: historical overview, celestial, on-board, radio, satellites*

TOPIC NAVB 2 — THE EARTH			
Subtopic NAVB 2.1 — Place and movement of the Earth			
BASIC NAVB 2.1.1	Explain the Earth's properties and their effects.	2	*Optional content: form, size, rotation, revolution in space, seasons, day, night, twilight, units of time, time zones, UTC*
Subtopic NAVB 2.2 — System of coordinates, direction and distance			
BASIC NAVB 2.2.1	Characterise the general principles of a grid system.	2	*Optional content: degrees, minutes, seconds, WGS-84, latitude/longitude*
BASIC NAVB 2.2.2	Explain direction and distance on a globe.	2	*Optional content: great circle, small circle, rhumb line, cardinal points, intercardinal points*
BASIC NAVB 2.2.3	Estimate position on the Earth's surface.	3	*Optional content: latitude/longitude*
BASIC NAVB 2.2.4	Estimate distance and direction between two points.	3	
BASIC NAVB 2.2.5	State the reference system used in aviation.	1	WGS 84 *Optional content: impact of alternative reference models*
Subtopic NAVB 2.3 — Magnetism			
BASIC NAVB 2.3.1	Explain the general principles of the Earth's magnetism.	2	True North, magnetic North, variation, deviation, inclination, declination
BASIC NAVB 2.3.2	Calculate conversions between the three north designations.	3	True North, magnetic North, compass North

TOPIC NAVB 3 — MAPS AND AERONAUTICAL CHARTS			
Subtopic NAVB 3.1 — Map making and projections			
BASIC NAVB 3.1.1	State how the Earth is projected to create a map.	1	Types of projection
BASIC NAVB 3.1.2	Describe the properties of a map.	2	Projection, scale
BASIC NAVB 3.1.3	Describe the properties of an ideal map.	2	*Optional content: conformality, constant scale, true azimuth, rhumb lines and great circles*
BASIC NAVB 3.1.4	State the properties and use of different projections.	1	*Optional content: Lambert, Mercator, stereographic*
Subtopic NAVB 3.2 — Maps and charts used in aviation			
BASIC NAVB 3.2.1	Differentiate between the various maps and charts.	2	
BASIC NAVB 3.2.2	State the specific use of various maps and charts.	1	
BASIC NAVB 3.2.3	Decode symbols and information displayed on maps and charts.	3	*Optional content: topographical features, NAV aids, fixes, fly over and fly by waypoints, etc.*

TOPIC NAVB 4 — NAVIGATIONAL BASICS			
Subtopic NAVB 4.1 — Influence of wind			
BASIC NAVB 4.1.1	Appreciate the influence of wind on the flight path.	3	Heading, track, drift, wind vector *Optional content: triangle of velocities*
Subtopic NAVB 4.2 — Speed			
BASIC NAVB 4.2.1	Explain the relationship between various speeds used in aviation.	2	True air speed, ground speed, indicated air speed (including Mach number)
BASIC NAVB 4.2.2	Appreciate the use of various speeds in ATC.	3	
Subtopic NAVB 4.3 — Visual navigation			
BASIC NAVB 4.3.1	Describe visual navigation.	2	Map reading, visual reference
BASIC NAVB 4.3.2	State the cases where visual navigation is primarily used in commercial aviation.	1	Approach and landing, taxiing *Optional content: visual aids*
Subtopic NAVB 4.4 — Navigational aspects of flight planning			
BASIC NAVB 4.4.1	Describe the navigational aspects affecting flight planning.	2	*Optional content: fuel/time calculations, min altitudes, alternative routes, weather conditions, ICAO Flight Plan (Item 18 use)*

TOPIC NAVB 5 — INSTRUMENT NAVIGATION			
Subtopic NAVB 5.1 — Ground-based systems			
BASIC NAVB 5.1.1	Explain the basic working principles of ground-based systems.	2	VDF, NDB, VOR, DME, ILS *Optional content: TACAN*
BASIC NAVB 5.1.2	State the use of ground-based systems.	1	VDF, NDB, VOR, DME, ILS *Optional content: TACAN*
BASIC NAVB 5.1.3	Characterise the main radio navigation techniques based on ground-based systems.	2	Area navigation, conventional navigation *Optional content: homing, inbound/ outbound tracking, instrument approach procedures, holding, drift assessment*
BASIC NAVB 5.1.4	Explain the accuracy and limitations of ground-based systems.	2	VDF, NDB, VOR, DME, ILS *Optional content: TACAN*
Subtopic NAVB 5.2 — Inertial navigation systems			
BASIC NAVB 5.2.1	Explain the basic working principles, precision and limitations of on-board systems.	2	*Optional content: INS/IRS*
BASIC NAVB 5.2.2	State the use of on-board systems.	1	
Subtopic NAVB 5.3 — Satellite-based systems			
BASIC NAVB 5.3.1	Explain the basic working principles of a satellite positioning system.	2	*Optional content: GPS, GLONASS, Galileo, Beidou*
BASIC NAVB 5.3.2	State the basic principles of GNSS concept.	1	Basic, ABAS, SBAS, GBAS *Optional content: core constellations, MCMF, integrity, RAIM, accuracy improvement, geometric altitude accuracy*
BASIC NAVB 5.3.3	Explain the limitations of satellite-based systems.	2	GPS, Galileo Optional content: GLONASS, Beidou, integrity, GPS NOTAMs
Subtopic NAVB 5.4 — Instrument approach procedures			
BASIC NAVB 5.4.1	Recognise various types of instrument approach using aeronautical charts.	1	Precision Approach (PA), Approach Procedure with Vertical guidance (APV), Non-Precision Approach (NPA)
BASIC NAVB 5.4.2	Differentiate between precision approach and non-precision approach procedures.	2	
BASIC NAVB 5.4.3	Recognise the different minima used during an instrument approach.	1	
BASIC NAVB 5.4.4	Define the terms appropriate to instrument approach minima.	1	OCA/OCH, MDA/MDH and DA/DH
BASIC NAVB 5.4.5	List the instrumental approach fixes.	1	IAF, IF, FAF, FAP, MAPt

TOPIC NAVB 6 — PERFORMANCE-BASED NAVIGATION			
Subtopic NAVB 6.1 — Principles and benefits of area navigation			
BASIC NAVB 6.1.1	Explain the basic principles of area navigation.	2	*Optional content: Requirement for navigation computer, suitable sensors, ICAO Doc 9613*
BASIC NAVB 6.1.2	State the benefits of area navigation.	1	*Optional content: ICAO Doc 9613*
BASIC NAVB 6.1.3	State the effects of navigational performance accuracy of RNAV systems on the flight.	1	TSE, PDE, NSE, FTE *Optional content: high-quality data, ICAO Doc 9613*
BASIC NAVB 6.1.4	Characterise the main aircraft and avionics functionalities used in area navigation.	2	*Optional content: database, fly over and fly by waypoints transitions, managed turns (RF and FRT) path terminators, parallel offset, autopilot/flight director (AP/FD)*
BASIC NAVB 6.1.5	Characterise the navigational functions of FMS.	2	*Optional content: VNAV, LNAV*
Subtopic NAVB 6.2 — Introduction to PBN			
BASIC NAVB 6.2.1	State the general concept of PBN.	1	Components of PBN *Optional content: key enabler, ICAO Doc 9613*
BASIC NAVB 6.2.2	Differentiate between RNAV and RNP.	2	On-board performance monitoring and alerting *Optional content: different generations of aircraft and on-board systems*
BASIC NAVB 6.2.3	State the navigation infrastructure that may be used in PBN.	1	VOR, DME, GNSS *Optional content: functionality IRS/INS*
BASIC NAVB 6.2.4	State the benefits of PBN concept.	1	*Optional content: global interoperability, limited number of navigation specifications, the PBN concept enables continuous descent operations (CDO) and continuous climb operations (CCO)*
BASIC NAVB 6.2.5	List the navigation specifications and the phases of flight they are applicable to.	1	RNAV 10, RNAV 5, RNAV 2, RNAV 1, RNP 4, RNP 2, RNP 1, RNP 0.3, A-RNP, RNP APCH and RNP AR APCH *Optional content: ICAO Doc 9613*
Subtopic NAVB 6.3 — PBN applications			
BASIC NAVB 6.3.1	State the navigation applications	1	RNAV 5, RNAV 1, RNP 1 with RF, RNP 0.3, RNP APCH *Optional content: Relevant national regulations*

TOPIC NAVB 7 — DEVELOPMENTS IN NAVIGATION			
Subtopic NAVB 7.1 — Future developments			
BASIC NAVB 7.1.1	State future developments in navigation.	1	*Optional content: 3D VNAV outside FA, trajectory-based operations*

SUBJECT 6: AIRCRAFT

The subject objective is:

Learners shall describe the basic principles of the theory of flight and aircraft characteristics and how these influence ATS operations.

TOPIC ACFTB 1 — INTRODUCTION TO AIRCRAFT			
Subtopic ACFTB 1.1 — Application of units of measurement			
BASIC ACFTB 1.1.1	Apply the units of measurement appropriate to aircraft and principles of flight.	3	
Subtopic ACFTB 1.2 — Aviation and aircraft			
BASIC ACFTB 1.2.1	Explain the relevance of theory of flight and aircraft characteristics in ATS operations.	2	

TOPIC ACFTB 2 — PRINCIPLES OF FLIGHT			
Subtopic ACFTB 2.1 — Forces acting on aircraft			
BASIC ACFTB 2.1.1	Explain the forces acting on an aircraft in flight and their interaction.	2	Lift, thrust, drag, weight during level flight *Optional content: during climb, descent, turn*
BASIC ACFTB 2.1.2	Explain causes and effects of wake turbulence.	2	Induced drag
Subtopic ACFTB 2.2 — Structural components and control of an aircraft			
BASIC ACFTB 2.2.1	Describe the main structural components of an aircraft.	2	Rotary and fixed wing, tail plane, fuselage, flap, aileron, elevator, rudder, landing gear
BASIC ACFTB 2.2.2	Explain how the pilot controls the movements of an aircraft.	2	Rudder, aileron, elevator, throttle, rotary wing controls
BASIC ACFTB 2.2.3	Explain the factors affecting aircraft stability.	2	
Subtopic ACFTB 2.3 — Flight envelope			
BASIC ACFTB 2.3.1	Characterise the critical factors which affect aircraft performance.	2	Maximum speeds, minimum and stall speeds, ceiling, critical angle of attack, maximum ROC

TOPIC ACFTB 3 — AIRCRAFT CATEGORIES			
Subtopic ACFTB 3.1 — Aircraft categories			
BASIC ACFTB 3.1.1	List the different categories of aircraft.	1	Fixed wing, rotary wing, balloon, glider, RPAS
Subtopic ACFTB 3.2 — Wake turbulence categories			
BASIC ACFTB 3.2.1	List the wake turbulence categories.	1	ICAO Doc 4444

Subtopic ACFTB 3.3 — ICAO approach categories			
BASIC ACFTB 3.3.1	List the ICAO approach categories.	1	ICAO Doc 8168
Subtopic ACFTB 3.4 — Environmental categories			
BASIC ACFTB 3.4.1	List ICAO noise classification.		ICAO Annex 16 *Optional content* *https://www.easa.europa.eu/eaer/topics/technology-and-design/aircraft-noise and relevant national regulations*

TOPIC ACFTB 4 — AIRCRAFT DATA			
Subtopic ACFTB 4.1 — Recognition			
BASIC ACFTB 4.1.1	Recognise the most commonly used aircraft.	1	
Subtopic ACFTB 4.2 — Performance data			
BASIC ACFTB 4.2.1	State the ICAO aircraft type designators and categories for the most commonly used aircraft.	1	Type designators, approach and wake turbulence categories
BASIC ACFTB 4.2.2	State the standard average performance data of the most commonly used aircraft.	1	Rate of climb/descent, cruising speed, ceiling

TOPIC ACFTB 5 — AIRCRAFT ENGINES			
Subtopic ACFTB 5.1 — Piston engines			
BASIC ACFTB 5.1.1	Explain the operating principles, advantages and disadvantages of the piston engine and propeller.	2	Piston engines, fixed pitch, variable pitch, number of blades
Subtopic ACFTB 5.2 — Jet engines			
BASIC ACFTB 5.2.1	Explain the operating principles, advantages and disadvantages of the jet engine.	2	
BASIC ACFTB 5.2.2	List the different types of jet engines.	1	
Subtopic ACFTB 5.3 — Turboprop engines			
BASIC ACFTB 5.3.1	Explain the operating principles, advantages and disadvantages of the turboprop engine and propeller.	2	
Subtopic ACFTB 5.4 — Aviation fuels			
BASIC ACFTB 5.4.1	List the most common aviation fuels.	1	

TOPIC ACFTB 6 — AIRCRAFT SYSTEMS AND INSTRUMENTS			
Subtopic ACFTB 6.1 — Flight instruments			
BASIC ACFTB 6.1.1	Explain the basic operating principles and interpretation of the information displayed by flight instruments.	2	Altimeter, air speed indicator, vertical speed indicator, turn and bank indicator, artificial horizon, gyrosyn compass
BASIC ACFTB 6.1.2	Explain the impact of errors and abnormal indications of flight instruments on aircraft operations.	2	*Optional content: pitot-static failures, unreliable gyro source*
Subtopic ACFTB 6.2 — Navigational instruments			
BASIC ACFTB 6.2.1	Describe the basic on-board operating principles and interpretation of the information displayed by navigational instruments/systems.	2	*Optional content: ADF, VOR (TACAN), DME, ILS, inertial reference system, satellite-based systems*
Subtopic ACFTB 6.3 — Engine instruments			
BASIC ACFTB 6.3.1	List the vital engine monitoring parameters and their associated instruments.	1	*Optional content: oil pressure and temperature, engine temperature, rpm, fuel state and flow*
Subtopic ACFTB 6.4 — Aircraft systems			
BASIC ACFTB 6.4.1	Explain the use of the most common aircraft systems.	2	SSR transponder, GPWS, EFIS, flight director, autopilot, FMS, ice protection systems *Optional content: ADS capability, head-up display, wind shear indicator, weather radar, hydraulic system, electrical system, environmental system*
BASIC ACFTB 6.4.2	Explain the impact of degradation/failure of the most common aircraft systems on aircraft operations.	2	Engine failure *Optional content: hydraulic failure, electrical failure, environmental system failure, degradation of aircraft position source data*

TOPIC ACFTB 7 — FACTORS AFFECTING AIRCRAFT PERFORMANCE			
Subtopic ACFTB 7.1 — Take-off factors			
BASIC ACFTB 7.1.1	Explain the factors affecting aircraft during take-off.	2	Runway conditions, runway slope, wind, temperature, aerodrome elevation, aircraft mass
Subtopic ACFTB 7.2 — Climb factors			
BASIC ACFTB 7.2.1	Explain the factors affecting aircraft during climb.	2	Speed, mass, wind, wind shear, temperature, cabin pressurisation, air density
Subtopic ACFTB 7.3 — Cruise factors			
BASIC ACFTB 7.3.1	Explain the factors affecting aircraft during cruise.	2	Level, cruising speed, wind, mass, cabin pressurisation
Subtopic ACFTB 7.4 — Descent and initial approach factors			
BASIC ACFTB 7.4.1	Explain the factors affecting aircraft during descent.	2	Wind, speed, rate of descent, aircraft configuration, cabin pressurisation
BASIC ACFTB 7.4.2	Explain the factors affecting an aircraft in a holding pattern.	2	Speed, level, turbulence, icing

BASIC ACFTB 7.4.3	Explain the benefits of continuous descent operations.	2	
Subtopic ACFTB 7.5 — Final approach and landing factors			
BASIC ACFTB 7.5.1	Explain the factors affecting aircraft during final approach and landing.	2	Aircraft configuration, mass, wind, wind shear, aerodrome elevation, runway conditions, runway slope
Subtopic ACFTB 7.6 — Economic factors			
BASIC ACFTB 7.6.1	Explain the economic consequences of ATC changes on the flight profile of an aircraft.	2	Routing, flight level, speed, rates of climb or descent, continuous descent operations (CDO), continuous climb operations (CCO)
Subtopic ACFTB 7.7 — Environmental factors			
BASIC ACFTB 7.7.1	Explain performance restrictions due to environmental considerations.	2	*Optional content: continuous descent operations (CDO), continuous climb operations (CCO), fuel-dumping, noise- abatement procedures,*

SUBJECT 7: HUMAN FACTORS

The subject objective is
Learners shall characterise factors which affect personal and team performance.

TOPIC HUMB 1 — INTRODUCTION TO HUMAN FACTORS			
Subtopic HUMB 1.1 — Learning techniques			
BASIC HUMB 1.1.1	Appreciate appropriate learning techniques.	3	How the influence of interactive techniques can lead to improved learning
Subtopic HUMB 1.2 — Relevance of human factors for ATC			
BASIC HUMB 1.2.1	Explain the relevance and importance of human factors.	2	Historical background, safety impact on ATM, licensing requirements, incidents
Subtopic HUMB 1.3 — Human factors and ATC			
BASIC HUMB 1.3.1	Define human factors.	1	*Optional content: ICAO Human Factors Training Manual*
BASIC HUMB 1.3.2	Explain the relationship between human factors and the aviation environment.	2	*Optional content: ICAO Human Factors Training Manual, visits to the simulator and operational room, SHELL model, PEAR model*
BASIC HUMB 1.3.3	Explain the concept of systems.	2	People, procedures, equipment
BASIC HUMB 1.3.4	Explain ATM in systems terms.	2	
BASIC HUMB 1.3.5	Explain the consequences of a system failure in ATS.	2	
BASIC HUMB 1.3.6	Explain the need for matching human and equipment.	2	*Optional content: ICAO Human Factors Training Manual*
BASIC HUMB 1.3.7	Explain the information requirement of ATC.	2	Relevant, timely, accurate
BASIC HUMB 1.3.8	Describe the role of the human in the evolution of ATC.	2	*Optional content: history of ATC, airspace, communications, radar, advanced ATS systems, the future of ATC*
BASIC HUMB 1.3.9	Explain the importance of situational awareness for decision-making.	2	

TOPIC HUMB 2 — HUMAN PERFORMANCE			
Subtopic HUMB 2.1 — Individual behaviour			
BASIC HUMB 2.1.1	Explain the differences and commonalities that exist among people.	2	*Optional content: attitude, cultural, language*
BASIC HUMB 2.1.2	Explain the dangers of boredom.	2	

BASIC HUMB 2.1.3	Explain the dangers of overconfidence and complacency.	2	
BASIC HUMB 2.1.4	Explain the dangers of fatigue.	2	Sleep disturbance, heavy workload
Subtopic HUMB 2.2 — Safety culture and professional conduct			
BASIC HUMB 2.2.1	Characterise the role of air traffic controller for positive safety culture.	2	
BASIC HUMB 2.2.2	Describe the need for professional standards in ATC.	2	*Optional content: adherence to rules and regulations, etc.*
BASIC HUMB 2.2.3	Appreciate the needed basic professional attitude appropriate to a high level of safety.	3	*Optional content: punctuality, rigour, adherence to rules, teamwork attitude*
BASIC HUMB 2.2.4	Describe the impact of responsibility on controllers' action(s).	2	Responsibility as a guidance for appropriate action
BASIC HUMB 2.2.5	Recognise the different responsibilities of a controller.	1	Prospective and retrospective responsibility, guilt and obligation, types of responsibility (moral, welfare, legal, task, role responsibility, etc.)
Subtopic HUMB 2.3 — Health and well-being			
BASIC HUMB 2.3.1	Consider the effect of health on performance.	2	*Optional content: fitness, diet, drugs, alcohol*
Subtopic HUMB 2.4 — Teamwork			
BASIC HUMB 2.4.1	Describe the differences between social human relations and professional interactions.	2	
BASIC HUMB 2.4.2	Describe the different types and characters in a team.	2	*Optional content: leader, follower*
BASIC HUMB 2.4.3	Appreciate the principles of teamwork.	3	*Optional content: team membership, group dynamics, advantages/ disadvantages of teamwork, conflicts and their solutions*
BASIC HUMB 2.4.4	Describe leader style and group interaction.	2	
Subtopic HUMB 2.5 — Basic needs of people at work			
BASIC HUMB 2.5.1	List basic needs of people at work.	1	*Optional content: balance between individual ability and workload, working time and rest periods; adequate physical working conditions, positive working environment*
BASIC HUMB 2.5.2	Characterise the factors of work satisfaction.	2	*Optional content: money, achievement, recognition, advancement, challenge*

Subtopic HUMB 2.6 — Stress			
BASIC HUMB 2.6.1	Define stress.	1	Stress definition *Optional content: EATCHIP Human Factors Module — Stress*
BASIC HUMB 2.6.2	Describe stress symptoms and sources.	2	Behavioural changes, lifestyle changes, physical symptoms, crisis events, main causes of stress *Optional content: EATCHIP Human Factors Module — Stress*
BASIC HUMB 2.6.3	Describe the stages of stress.	2	Stress performance curve *Optional content: EATCHIP Human Factors Module — Stress*
BASIC HUMB 2.6.4	Appreciate techniques for stress management.	3	*Optional content: relaxation techniques, diet and lifestyle, exercise, EATCHIP Human Factors Module — Stress*
TOPIC HUMB 3 — HUMAN ERROR			
Subtopic HUMB 3.1 — Dangers of error			
BASIC HUMB 3.1.1	Recognise the dangers of error in ATC.	1	*Optional content: Air Traffic Control — Human Performance Factors (Anne Isaac, 1999), Human Factors in Air Traffic Control (V. David Hopkin, 1995)*
Subtopic HUMB 3.2 — Definition of human error			
BASIC HUMB 3.2.1	Define human error.	1	
BASIC HUMB 3.2.2	Describe the factors which contribute to cause error.	2	Fatigue, lack of skill, misunderstanding, multitasking, lack of information, distraction, lack of work satisfaction
Subtopic HUMB 3.3 — Classification of human error			
BASIC HUMB 3.3.1	State the types of errors.	1	*Optional content: slips, lapses, mistakes*
BASIC HUMB 3.3.2	Define violations.	1	
BASIC HUMB 3.3.3	Differentiate between errors and violations of rules.	2	
BASIC HUMB 3.3.4	Describe the three levels of performance according to the Rasmussen model.	2	Skill based, knowledge based, rule based
Subtopic HUMB 3.4 — Risk analysis and risk management			
BASIC HUMB 3.4.1	Describe risk analysis and risk management of human systems and error.	2	Active failures and latent conditions *Optional content: Reason model, HFACS (Human Factors Analysis & Classification System) model, Heinrich Theory*
BASIC HUMB 3.4.2	Apply one risk analysis model on error during a case study.	3	

TOPIC HUMB 4 — COMMUNICATION			
Subtopic HUMB 4.1 — Importance of good communication in ATC			
BASIC HUMB 4.1.1	Appreciate the importance of good communication in ATC.	3	
Subtopic HUMB 4.2 — Communication process			
BASIC HUMB 4.2.1	Define communication.	1	
BASIC HUMB 4.2.2	Define the communication process.	1	*Optional content: sender, encoder, transmitter, signal, interference, reception, decoder, receiver, feedback*
Subtopic HUMB 4.3 — Communication modes			
BASIC HUMB 4.3.1	Describe the factors which affect verbal communication.	2	*Optional content: word choice, intonation, speed, tone, distortion, load, expectation, noise, interruption, language knowledge (i.e. accent, dialect, vocabulary)*
BASIC HUMB 4.3.2	Describe the factors which affect non-verbal communication.	2	*Optional content: touch, choice, expectation, noise, interruption*
BASIC HUMB 4.3.3	Apply good communication practices.	3	Speaking and listening

TOPIC HUMB 5 — THE WORK ENVIRONMENT			
Subtopic HUMB 5.1 — Ergonomics and the need for good design			
BASIC HUMB 5.1.1	Define ergonomics.	1	
BASIC HUMB 5.1.2	Recognise the need for good building design.	1	*Optional content: light, insulation, decor, space, facilities*
BASIC HUMB 5.1.3	Explain the need for good work position design.	2	*Optional content: anthropometry (seating, workstation design, input device, etc.)*
Subtopic HUMB 5.2 — Equipment and tools			
BASIC HUMB 5.2.1	Characterise the equipment and tools that will be used in simulation in accordance with the SHELL model.	2	The physical environment, visual displays, suites, input devices, communications equipment, console profile and layout
Subtopic HUMB 5.3 — Automation			
BASIC HUMB 5.3.1	Explain the reasons for automation.	2	
BASIC HUMB 5.3.2	Describe the advantages and constraints of automation.	2	

SUBJECT 8: EQUIPMENT AND SYSTEMS

The subject objective is:

Learners shall explain the basic working principles of equipment that is generally used in ATC and appreciate how this equipment aids the controller in providing safe and efficient ATS.

TOPIC EQPSB 1 — ATC EQUIPMENT			
Subtopic EQPSB 1.1 — Main types of ATC equipment			
BASIC EQPSB 1.1.1	Explain the relevance of ATC equipment.	2	CWP, communication equipment, ATS surveillance systems

TOPIC EQPSB 2 — RADIO			
Subtopic EQPSB 2.1 — Radio theory			
BASIC EQPSB 2.1.1	State the principles of radio waves.	1	
BASIC EQPSB 2.1.2	Describe the characteristics of radio waves.	2	Propagation, limitations
BASIC EQPSB 2.1.3	State the use, characteristics and limitations of frequency bands.	1	Use in ATC, navigation and communications, use and application in the Aeronautical Mobile Service, HF, VHF, UHF
BASIC EQPSB 2.1.4	State the different uses of radio wave spectrum.	1	
Subtopic EQPSB 2.2 — Direction finding			
BASIC EQPSB 2.2.1	State the principles and use of VDF/UDF.	1	VDF/UDF, QDM, QDR, QTF
BASIC EQPSB 2.2.2	State the precision of VDF/UDF used in the State system.	1	

TOPIC EQPSB 3 — COMMUNICATION EQUIPMENT			
Subtopic EQPSB 3.1 — Radio communications			
BASIC EQPSB 3.1.1	State the use of the radio in ATC.	1	
BASIC EQPSB 3.1.2	Describe the working principles of a transmitting and receiving system.	2	
BASIC EQPSB 3.1.3	Explain the effect of antenna shadowing on RTF communications.	2	
Subtopic EQPSB 3.2 — Voice communication between ATS units/positions			
BASIC EQPSB 3.2.1	Describe the use of other voice communications in ATC.	2	*Optional content: telephone, interphone, intercom*

Subtopic EQPSB 3.3 — Data link communications			
BASIC EQPSB 3.3.1	Explain the use and benefits of Controller Pilot Data Link Communications (CPDLC).	2	
Subtopic EQPSB 3.4 — Airline communications			
BASIC EQPSB 3.4.1	State the use of SELCAL.	1	
BASIC EQPSB 3.4.2	Explain the use and benefits of Aircraft Communications Addressing and Reporting System (ACARS).	2	

TOPIC EQPSB 4 — INTRODUCTION TO SURVEILLANCE			
Subtopic EQPSB 4.1 — Surveillance concept in ATS			
BASIC EQPSB 4.1.1	Describe the concept of surveillance for the provision of ATS.	2	

TOPIC EQPSB 5 — RADAR			
Subtopic EQPSB 5.1 — Principles of radar			
BASIC EQPSB 5.1.1	State the principles of radar.	1	
BASIC EQPSB 5.1.2	Recognise the characteristics of radar wavelengths.	1	
BASIC EQPSB 5.1.3	Recognise the use, characteristics and limitations of different radar types.	1	*Optional content: frequency bands, long and short-range radar, weather radar, high-resolution radar*
Subtopic EQPSB 5.2 — Primary radar			
BASIC EQPSB 5.2.1	Explain the working principles of PSR.	2	
Subtopic EQPSB 5.3 — Secondary radar			
BASIC EQPSB 5.3.1	Explain the working principles of SSR.	2	Mode A, Mode C
BASIC EQPSB 5.3.2	Explain SSR code management	2	Discrete, non-discrete codes, special codes
BASIC EQPSB 5.3.3	Explain the effect of antenna shadowing on SSR operation.	2	
Subtopic EQPSB 5.4 — Use of radars			
BASIC EQPSB 5.4.1	Explain the use of PSR/SSR in ATC.	2	Area, approach, aerodrome, surface movement radar, DFTI
BASIC EQPSB 5.4.2	Explain the advantages and disadvantages of PSR/SSR.	2	

Subtopic EQPSB 5.5 — Mode S			
BASIC EQPSB 5.5.1	Explain the principles of Mode S.	2	
BASIC EQPSB 5.5.2	Explain the use of Mode S in ATC systems.	2	
TOPIC EQPSB 6 — AUTOMATIC DEPENDENT SURVEILLANCE			
Subtopic EQPSB 6.1 — Principles of automatic dependent surveillance			
BASIC EQPSB 6.1.1	State the different applications of ADS.	1	ADS-B, ADS-C
BASIC EQPSB 6.1.2	Explain the working principles of ADS.	2	
Subtopic EQPSB 6.2 — Use of automatic dependent surveillance			
BASIC EQPSB 6.2.1	Describe the use of ADS in ATC.	2	Area, approach, aerodrome, ICAO Doc 4444
BASIC EQPSB 6.2.2	Explain the limitations of ADS.	2	Dependency on GNSS, dependency on airborne equipment
TOPIC EQPSB 7 — MULTILATERATION			
Subtopic EQPSB 7.1 — Principles of multilateration			
BASIC EQPSB 7.1.1	State the different applications of MLAT.	1	*Optional content: ATC, environmental management, airport operations, LAM, WAM*
BASIC EQPSB 7.1.2	Explain the working principles of MLAT.	2	*Optional content: passive and active MLAT*
Subtopic EQPSB 7.2 — Use of multilateration			
BASIC EQPSB 7.2.1	Describe the use of MLAT in ATC.	2	Area, approach, aerodrome
BASIC EQPSB 7.2.2	Explain the limitations of MLAT.	2	Dependency on airborne equipment

TOPIC EQPSB 8 — SURVEILLANCE DATA PROCESSING			
Subtopic EQPSB 8.1 — Surveillance data networking			
BASIC EQPSB 8.1.1	Explain the advantages and disadvantages of different surveillance technologies.	2	Data quality, coverage, refresh rate, reliability, redundancy, cost-effectiveness
BASIC EQPSB 8.1.2	Describe the implementation of Surveillance Data Networks.	2	*Optional content: different technologies/sensors, network*
Subtopic EQPSB 8.2 — Working principles of surveillance data networking			
BASIC EQPSB 8.2.1	Explain the working principles of surveillance data processing.	2	Track fusion process, surveillance information presented on CWP
BASIC EQPSB 8.2.2	State other use of processed surveillance data.	1	*Optional content: safety nets, airport operations, environmental management*

TOPIC EQPSB 9 — FUTURE EQUIPMENT			
Subtopic EQPSB 9.1 — New developments			
BASIC EQPSB 9.1.1	State the developments in the equipment field for introduction in the near future.	1	

TOPIC EQPSB 10 — AUTOMATION IN ATS			
Subtopic EQPSB 10.1 — Principles of automation			
BASIC EQPSB 10.1.1	Describe the principles of automation in communication and data links in ATS.	2	
Subtopic EQPSB 10.2 — Aeronautical fixed telecommunication network (AFTN)			
BASIC EQPSB 10.2.1	Describe the principles of AFTN.	2	
Subtopic EQPSB 10.3 — Online data interchange			
BASIC EQPSB 10.3.1	Describe the benefits of automatic exchange of ATS data in coordination and transfer processes.	2	Accuracy, speed and safety, non-verbal communication
BASIC EQPSB 10.3.2	Describe the limitations of automatic exchange of ATS data in coordination.	2	Non-recognition of a system's failure
Subtopic EQPSB 10.4 — Systems used for the automatic dissemination of information			
BASIC EQPSB 10.4.1	State the working principles of broadcasting systems.	1	*Optional content: ATIS, VOLMET*
BASIC EQPSB 10.4.2	Explain the use of ATIS and VOLMET in ATS.	2	ICAO Annex 3

TOPIC EQPSB 11 — WORKING POSITIONS			
Subtopic EQPSB 11.1 — Working position equipment			
BASIC EQPSB 11.1.1	Recognise equipment in a working position.	1	*Optional content: FPB, radio, telephone and other communications equipment, relevant maps and charts, strip printer, teleprinter, clock, information monitors, situation displays*
Subtopic EQPSB 11.2 — Aerodrome control			
BASIC EQPSB 11.2.1	Recognise equipment to be found specifically in a TWR.	1	*Optional content: wind indicator, aerodrome traffic monitor, SMR, crash alarm, signalling lamp, lighting control panel, runway-in-use indicator, binoculars, signalling/flare gun, IRVR and altimeter-setting indicators, local information systems*
Subtopic EQPSB 11.3 — Approach control			
BASIC EQPSB 11.3.1	Recognise equipment to be found specifically in an APP.	1	*Optional content: sequencing system, PAR, RVR indicators*
Subtopic EQPSB 11.4 — Area control			
BASIC EQPSB 11.4.1	Recognise equipment to be found specifically in an ACC.	1	

SUBJECT 9: PROFESSIONAL ENVIRONMENT

The subject objective is:

Learners shall recognise the need for close cooperation with other parties concerning ATM operations and aspects of environmental protection.

TOPIC PENB 1 — FAMILIARISATION			
Subtopic PENB 1.1 — ATS and aerodrome facilities			
BASIC PENB 1.1.1	Recognise civil and military ATS facilities.	1	*Optional content: TWR, APP, ACC, AIS, RCC, Air Defence Unit*
BASIC PENB 1.1.2	Recognise airport facilities and local operators.	1	*Optional content: firefighting and emergency services, airline operations*

TOPIC PENB 2 — AIRSPACE USERS			
Subtopic PENB 2.1 — Civil aviation			
BASIC PENB 2.1.1	Describe airspace usage by civil aircraft.	2	*Optional content: commercial flying, recreational flying, RPAS, gliders, balloons, calibration flights, aerial photography, skydiving*
Subtopic PENB 2.2 — Military			
BASIC PENB 2.2.1	Describe airspace usage by the military.	2	Airspace reservations, training, interception, in-flight refuelling, RPAS *Optional content: low-level flying, test flights, special military operations*
Subtopic PENB 2.3 — Expectations and requirements of pilots			
BASIC PENB 2.3.1	Recognise the expectations and requirements of pilots.	1	
BASIC PENB 2.3.2	State the use of Standard Operating Procedures (SOPs) by aircraft operators.	1	

TOPIC PENB 3 — CUSTOMER RELATIONS			
Subtopic PENB 3.1 — Customer relations			
BASIC PENB 3.1.1	State the role of ATC as a service provider.	1	
BASIC PENB 3.1.2	Recognise the means by which ATC is funded.	1	

TOPIC PENB 4 — ENVIRONMENTAL PROTECTION			
Subtopic PENB 4.1 — Environmental protection			
BASIC PENB 4.1.1	Describe the impact aviation has on the environment.	2	Noise, air quality, climate change, third-party risks
BASIC PENB 4.1.2	Explain the role of ATC in the concept of sustainable development.	2	*Optional content: ICAO Annex 16*
BASIC PENB 4.1.3	State how to measure, monitor and mitigate the impact aviation has on the environment.	1	*Optional content: relevant national regulations*

AMC1 ATCO.D.010(a)(2)(i) Composition of initial training

AERODROME CONTROL VISUAL RATING (ADV) TRAINING — SUBJECT OBJECTIVES AND TRAINING OBJECTIVES

(a) The general principles that apply to this AMC are contained in AMC1 ATCO.D.010(a).

(b) The ATCO rating training Aerodrome Control Visual Rating (ADV) should contain the following subject objectives and training objectives that are associated with the subjects, topics and subtopics contained in Appendix 3 to TCAR PEL Part ATCO.

(c) Subjects, topics and subtopics from Appendix 3 to TCAR PEL Part ATCO are repeated in this AMC for the convenience of the reader and do not form part of it.

SUBJECT 1: INTRODUCTION TO THE COURSE

The subject objective is:

Learners shall know and understand the training programme that they will follow and learn how to obtain the appropriate information.

TOPIC INTR 1 — COURSE MANAGEMENT				
Subtopic INTR 1.1 — Course introduction				
ADV INTR 1.1.1	Explain the aims and main objectives of the course.	2		ALL
Subtopic INTR 1.2 — Course administration				
ADV INTR 1.2.1	State how the course is administered.	1		ALL
Subtopic INTR 1.3 — Study material and training documentation				
ADV INTR 1.3.1	Use appropriate documents and their sources for course studies.	3	*Optional content: training documentation, library, CBT library, web, learning management server*	ALL
ADV INTR 1.3.2	Integrate appropriate information into course studies.	4	Training documentation *Optional content: supplementary information, library*	ALL

TOPIC INTR 2 — INTRODUCTION TO THE ATC TRAINING COURSE				
Subtopic INTR 2.1 — Course content and organisation				
ADV INTR 2.1.1	State the different training methods used during the course.	1	Theoretical training, practical training, self-study, types of training events	ALL
ADV INTR 2.1.2	State the subjects covered by the course and their purpose.	1		ALL
ADV INTR 2.1.3	Describe the organisation of theoretical training.	2	*Optional content: course programme*	ALL

ADV INTR 2.1.4	Describe the organisation of practical training.	2	*Optional content: PTP, simulation, briefing, debriefing, course programme*	ALL
Subtopic INTR 2.2 — Training ethos				
ADV INTR 2.2.1	Recognise the feedback mechanisms available.	1	Training progress, assessment, briefing, debriefing, learner–instructor feedback, instructor–instructor feedback	ALL
Subtopic INTR 2.3 — Assessment process				
ADV INTR 2.3.1	Describe the assessment process.	2		ALL

SUBJECT 2: AVIATION LAW

The subject objective is:

Learners shall know, understand and apply the Rules of the Air and the Regulations regarding reporting and airspace, and appreciate the Licensing and Competence principles.

TOPIC LAW 1 — ATCO LICENSING/CERTIFICATE OF COMPETENCE				
Subtopic LAW 1.1 — Privileges and conditions				
ADV LAW 1.1.1	Appreciate the conditions which shall be met to issue an Aerodrome Control Visual rating.	3	Relevant national regulation on ATCO Licensing *Optional content: national documents*	ADV
ADV LAW 1.1.2	Explain how to maintain and update professional knowledge and skills to retain competence in the operational environment.	2		ALL
ADV LAW 1.1.3	Explain the conditions for suspension/ revocation of an ATCO licence.	2	Relevant national regulation on ATCO Licensing	ALL

TOPIC LAW 2 — RULES AND REGULATIONS				
Subtopic LAW 2.1 — Reports				
ADV LAW 2.1.1	List the standard forms for reports.	1	Air traffic incident report *Optional content: routine air-reports, breach of regulations, watchbook/logbook, records*	ALL
ADV LAW 2.1.2	Describe the functions of, and processes for, reporting.	2	Reporting culture, air traffic incident report *Optional content: breach of regulations, watchbook/logbook, records, voluntary reporting*	ALL
ADV LAW 2.1.3	Use forms for reporting.	3	air traffic incident reporting form(s) *Optional content: routine air-reports, breach of regulations, watchbook/logbook, records*	ALL
Subtopic LAW 2.2 — Airspace				
ADV LAW 2.2.1	Appreciate airspace classes and structure and their relevance to operations using the Aerodrome Control Visual rating.	3		ADV
ADV LAW 2.2.2	Provide planning, coordination and control actions appropriate to the classification and structure of airspace.	4	*Optional content: international requirements, civil requirements, military requirements, areas of responsibility, sectorisation, national requirements*	ALL
ADV LAW 2.2.3	Appreciate responsibility for terrain clearance.	3		ALL

TOPIC LAW 3 — ATC SAFETY MANAGEMENT				
Subtopic LAW 3.1 — Feedback process				
ADV LAW 3.1.1	State the importance of controller contribution to the feedback process.	1	*Optional content: voluntary reporting*	ALL
ADV LAW 3.1.2	Describe how reported occurrences are analysed.	2	Relevant national regulations *Optional content: local procedures*	ALL
ADV LAW 3.1.3	Name the means used to disseminate recommendations.	1	*Optional content: safety letters, safety boards web pages*	ALL
ADV LAW 3.1.4	Appreciate the 'Just Culture' concept.	3	Benefits, prerequisites, constraints *Optional content: https://www.skybrary.aero*	ALL
Subtopic LAW 3.2 — Safety Investigation				
ADV LAW 3.2.1	Describe role and mission of Safety Investigation in the improvement of safety.	2		ALL
ADV LAW 3.2.2	Define working methods of Safety Investigation.	1		ALL

SUBJECT 3: AIR TRAFFIC MANAGEMENT

The subject objective is:

Learners shall manage air traffic to ensure safe, orderly and expeditious services.

TOPIC ATM 1 — PROVISION OF SERVICES				
Subtopic ATM 1.1 — Aerodrome control service				
ADV ATM 1.1.1	Appreciate areas of responsibility.	3	Control zone, traffic circuit, manoeuvring area, movement area, vicinity *Optional content: ATZ*	ADV ADI
ADV ATM 1.1.2	Provide aerodrome control service.	4	ICAO Annex 11, ICAO Doc 7030, ICAO Doc 4444, operation manuals	ADV ADI
Subtopic ATM 1.2 — Flight information service (FIS)				
ADV ATM 1.2.1	Describe the information that shall be passed on to aircraft by an aerodrome controller.	2	ICAO Doc 4444	ADV ADI
ADV ATM 1.2.2	Provide FIS.	4	ICAO Doc 4444, *Optional content: national documents*	*ALL*
ADV ATM 1.2.3	Issue appropriate information.	3	ICAO Doc 4444, essential local traffic, traffic information	ADV ADI
ADV ATM 1.2.4	Appreciate the use of ATIS in the provision of flight information service.	3		ADV ADI
Subtopic ATM 1.3 — Alerting service (ALRS)				
ADV ATM 1.3.1	Provide ALRS.	4	ICAO Doc 4444, *Optional content: national documents*	ALL
ADV ATM 1.3.2	Respond to distress and urgency messages and signals.	3	ICAO Annex 10, ICAO Doc 4444	ALL
Subtopic ATM 1.4 — ATS system capacity and air traffic flow management				
ADV ATM 1.4.1	Appreciate the impact of ATS system capacity and air traffic flow management on the controller.	3	*Optional content: Slot management, Slot allocation procedures, local implementation of the ATFCM principles*	ADV ADI
ADV ATM 1.4.2	Organise traffic to take account of flow management.	4	*Optional content: departure sequence*	ADV ADI
ADV ATM 1.4.3	Inform the appropriate authority of local factors affecting ATS system capacity and air traffic flow management.	3	*Optional content: abnormal situations, decrease in sector capacity, limitations on systems and equipment, changes in workload/capacity, unusual meteorological conditions, relevant information: reported ground-based incidents, forest fire, smoke, oil pollution*	ADV ADI

TOPIC ATM 2 — COMMUNICATION				
Subtopic ATM 2.1 — Effective communication				
ADV ATM 2.1.1	Use approved phraseology.	3	ICAO Doc 4444 and ICAO Doc 9432	ALL
ADV ATM 2.1.2	Ensure effective communication.	4	Communication techniques, readback/verification of readback	ALL

TOPIC ATM 3 — ATC CLEARANCES AND ATC INSTRUCTIONS				
Subtopic ATM 3.1 — ATC clearances				
ADV ATM 3.1.1	Issue appropriate ATC clearances.	3	*Optional content: ICAO Doc 4444, national documents*	ALL
ADV ATM 3.1.2	Integrate appropriate ATC clearances in control service.	4		ALL
ADV ATM 3.1.3	Ensure the agreed course of action is carried out.	4		ALL
Subtopic ATM 3.2 - ATC instructions				
ADV ATM 3.2.1	Issue appropriate ATC instructions.	3	ICAO Doc 4444 *Optional content: national documents*	ALL
ADV ATM 3.2.2	Integrate appropriate ATC instructions in control service.	4		ALL
ADV ATM 3.2.3	Ensure the agreed course of action is carried out.	4		ALL

TOPIC ATM 4 — COORDINATION				
Subtopic ATM 4.1 — Necessity for coordination				
ADV ATM 4.1.1	Identify the need for coordination.	3		ALL
Subtopic ATM 4.2 — Tools and methods for coordination				
ADV ATM 4.2.1	Use the available tools for coordination.	3	*Optional content: electronic transfer of flight data, telephone, interphone, intercom, direct speech, radiotelephone (RTF), local agreements, automated system coordination*	ALL
Subtopic ATM 4.3 — Coordination procedures				
ADV ATM 4.3.1	Initiate appropriate coordination.	3	Delegation/transfer of responsibility for air–ground communications and separation, transfer of control, etc., ICAO Doc 4444 *Optional content: release point*	ALL
ADV ATM 4.3.2	Analyse effect of coordination requested by an adjacent position/unit.	4	*Optional content: delegation/transfer of responsibility for air–ground communications and separation, release point, transfer of control, etc.*	ALL

ADV ATM 4.3.3	Select, after negotiation, an appropriate course of action.	5		ALL
ADV ATM 4.3.4	Ensure the agreed course of action is carried out.	4		ALL
ADV ATM 4.3.5	Coordinate when providing FIS.	4	ICAO Doc 4444	ALL
ADV ATM 4.3.6	Coordinate when providing ALRS.	4	ICAO Doc 4444	ALL

TOPIC ATM 5 — ALTIMETRY AND LEVEL ALLOCATION				
Subtopic ATM 5.1 — Altimetry				
ADV ATM 5.1.1	Allocate levels according to altimetry data.	4		ALL
ADV ATM 5.1.2	Ensure separation according to altimetry data.	4	*Optional content: transition level, transition altitude, transition layer, height, flight level, altitude, vertical distance to airspace boundaries*	ALL
ADV ATM 5.1.3	Provide planning, coordination and control actions appropriate to the rules for minimum safe height and terrain clearance.	4	*Optional content: terrain clearance dimensions, minimum safe altitudes, transition level, minimum flight level, minimum sector altitude*	ADV

TOPIC ATM 6 — SEPARATIONS				
Subtopic ATM 6.1 — Separation between departing aircraft				
ADV ATM 6.1.1	Provide separation between departing aircraft.	4	ICAO Doc 4444	ADV ADI
Subtopic ATM 6.2 - Separation of landing aircraft and preceding landing or departing aircraft				
ADV ATM 6.2.1	Provide separation of landing aircraft and preceding landing or departing aircraft.	4	ICAO Doc 4444	ADV *ADI*
Subtopic ATM 6.3 — Time-based wake turbulence longitudinal separation				
ADV ATM 6.3.1	Provide time-based wake turbulence longitudinal separation.	4	ICAO Doc 4444	ADV *ADI*
Subtopic ATM 6.4 — Reduced separation minima				
ADV ATM 6.4.1	Provide reduced separation minima.	4	ICAO Doc 4444	ADV *ADI*

TOPIC ATM 7 — AIRBORNE COLLISION AVOIDANCE SYSTEMS AND GROUND-BASED SAFETY NETS				
Subtopic ATM 7.1 — Airborne collision avoidance systems				
ADV ATM 7.1.1	Differentiate between ACAS advisory thresholds and aerodrome separation standards.	2	ICAO Doc 9863	ADV ADI
ADV ATM 7.1.2	Describe the controller responsibility during and following an ACAS RA reported by pilot.	2	ICAO Doc 4444	ALL
ADV ATM 7.1.3	Respond to pilot notification of actions based on airborne systems warnings.	3	TAWS *Optional content: ACAS*	ALL
Subtopic ATM 7.2 — Ground-based safety nets				
ADV ATM 7.2.1	Respond to available ground-based safety nets warnings.	3	*Optional content: anti-incursion*	ADV ADI

TOPIC ATM 8 — DATA DISPLAY				
Subtopic ATM 8.1 — Data management				
ADV ATM 8.1.1	Update the data display to accurately reflect the traffic situation.	3	*Optional content: information displayed, strip-marking procedures, electronic information data displays, actions based on traffic display information, calculation of EETs*	ALL
ADV ATM 8.1.2	Analyse pertinent data on data displays.	4		ALL
ADV ATM 8.1.3	Organise pertinent data on data displays.	4		ALL
ADV ATM 8.1.4	Obtain flight plan information.	3	CPL, FPL, supplementary information *Optional content: RPL, AFIL, etc.*	ALL
ADV ATM 8.1.5	Use flight plan information.	3		ALL

TOPIC ATM 9 — OPERATIONAL ENVIRONMENT (SIMULATED)				
Subtopic ATM 9.1 — Integrity of the operational environment				
ADV ATM 9.1.1	Obtain information concerning the operational environment.	3	*Optional content: briefing, notices, local orders, verification of information*	ALL
ADV ATM 9.1.2	Ensure the integrity of the operational environment.	4	*Optional content: frequency, VOLMET, ATIS, SIGMET, systems set-up, integrity of displays*	ADV ADI
Subtopic ATM 9.2 — Verification of the currency of operational procedures				
ADV ATM 9.2.1	Check all relevant documentation before managing traffic.	3	*Optional content: briefing, letters of agreement (LoAs), NOTAMs, AICs*	ALL

Subtopic ATM 9.3 — Handover-takeoverHandover–takeover				
ADV ATM 9.3.1	Transfer information to the relieving controller.	3		ALL
ADV ATM 9.3.2	Obtain information from the controller handing over.	3		ALL

TOPIC ATM 10 — PROVISION OF AN AERODROME CONTROL SERVICE				
Subtopic ATM 10.1 — Responsibility for the provision				
ADV ATM 10.1.1	Explain the responsibility for the provision of aerodrome control service.	2	ICAO Doc 4444, ICAO Annex 11	ADV ADI
ADV ATM 10.1.2	Describe the division of responsibility among air traffic control units.	2	ICAO Doc 4444	*ALL*
ADV ATM 10.1.3	Describe the responsibility in regard to military traffic.	2	ICAO Doc 4444 *Optional content: ICAO Doc 9554*	*ALL*
ADV ATM 10.1.4	Describe the responsibility in regard to unmanned free balloons.	2		ADV ADI
ADV ATM 10.1.5	Appreciate the influence of operational requirements.	3	*Optional content: military flying, calibration flights, aerial photography*	*ALL*
Subtopic ATM 10.2 — Functions of aerodrome control tower				
ADV ATM 10.2.1	Manage the general functions of aerodrome control.	4	ICAO Doc 4444	ADV ADI
ADV ATM 10.2.2	Manage the suspension of VFR operations.	4	ICAO Doc 4444	ADV ADI
ADV ATM 10.2.3	Manage SVFR traffic	4	ICAO Doc 4444	ADV *ADI*
Subtopic ATM 10.3 — Traffic management process				
ADV ATM 10.3.1	Ensure that situational awareness is maintained.	4	Information gathering, observation, traffic projection	ADV ADI
ADV ATM 10.3.2	Detect conflicts in time for appropriate resolution.	4		ALL
ADV ATM 10.3.3	Identify potential solutions to achieve a safe and effective flow of aerodrome traffic.	3		ADV ADI
ADV ATM 10.3.4	Evaluate possible outcomes of different control actions.	5		ADV ADI
ADV ATM 10.3.5	Select an appropriate plan in time to achieve safe and effective flow of aerodrome traffic.	5		ADV ADI

ADV ATM 10.3.6	Ensure an adequate priority of actions.	4		*ALL*
ADV ATM 10.3.7	Execute plan in a timely manner.	3		ADV ADI
ADV ATM 10.3.8	Ensure a safe and efficient outcome is achieved.	4	Traffic monitoring, adaptability and follow-up	ALL
Subtopic ATM 10.4 — Aeronautical ground lights				
ADV ATM 10.4.1	Select appropriate aeronautical ground lights.	5	ICAO Doc 4444	ADV ADI
Subtopic ATM 10.5 — Information to aircraft by aerodrome control tower				
ADV ATM 10.5.1	Provide information related to the operation of aircraft.	4	ICAO Doc 4444,	ADV ADI
ADV ATM 10.5.2	Provide information on aerodrome conditions.	4	ICAO Doc 4444,	ADV ADI
Subtopic ATM 10.6 — Control of aerodrome traffic				
ADV ATM 10.6.1	Predict positions of aircraft in the aerodrome traffic and taxi circuits.	4	ICAO Doc 4444	ADV ADI
ADV ATM 10.6.2	Manage traffic on the manoeuvring area.	4	ICAO Doc 4444, aircraft, vehicles *Optional content: runway inspection*	ADV ADI
ADV ATM 10.6.3	Manage traffic in accordance with a change to operational procedures.	4	*Optional content: taxiway closure*	ADV ADI
ADV ATM 10.6.4	Balance the workload against personal capacity.	5	*Optional content: replanning, prioritising solutions, denying requests, delaying traffic*	ADV ADI
Subtopic ATM 10.7 — Control of traffic in the traffic circuit				
ADV ATM 10.7.1	Manage traffic in the traffic circuit.	4	ICAO Doc 4444, meteorological phenomena, geographical knowledge, environmental factors	ADV ADI
ADV ATM 10.7.2	Manage arriving and departing traffic.	4	ICAO Doc 4444, allocation of the order of priority, meteorological phenomena, wake turbulence, environmental factors	ADV ADI
ADV ATM 10.7.3	Integrate the serviceability of radio aids in the management of aerodrome traffic.	4	*Optional content: UDF, VDF, ILS, NDB, VOR, DME*	ADV ADI
ADV ATM 10.7.4	Integrate surface conditions into the control of aerodrome traffic.	4	*Optional content: damp, wet, water patches, flooding, snow, slush, ice, braking action*	ADV ADI
ADV ATM 10.7.5	Integrate information about meteorological phenomena into the control of aerodrome traffic.	4	*Optional content: clouds, precipitation, visibility, wind, meteorological hazards*	ADV ADI

ADV ATM 10.7.6	Integrate the information provided by situation displays.	4	Use, advantages, disadvantages	ADV ADI
ADV ATM 10.7.7	Initiate missed approach.	3	*Optional content: obstructed runway*	ADV ADI
Subtopic ATM 10.8 — Runway in use				
ADV ATM 10.8.1	Select the runway in use.	5	ICAO Doc 4444	ADV ADI
ADV ATM 10.8.2	Coordinate runway in use.	4	*Optional content: approach control, area control, runway selection, change of runway*	ADV ADI
ADV ATM 10.8.3	Manage traffic in the event of runway- in-use change.	4	*Optional content:* https://www.skybrary.aero	ADV ADI

SUBJECT 4: METEOROLOGY

The subject objective is:

Learners shall acquire, decode and make proper use of meteorological information relevant to the provision of ATS.

TOPIC MET 1 — METEOROLOGICAL PHENOMENA				
Subtopic MET 1.1 — Meteorological phenomena				
ADV MET 1.1.1	Appreciate the impact of different cloud types.	3	Cumulus, cumulonimbus *Optional content: stratus, nimbostratus, etc.*	ADV ADI
ADV MET 1.1.2	Appreciate the impact of precipitation.	3	Precipitation and microphysics *Optional content: rain, snow, sleet, hail*	ADV ADI
ADV MET 1.1.3	Appreciate the impact of atmospheric obscurity.	3	*Optional content: advection fog, radiation fog, mixing, evaporation, mist, drizzle*	ADV ADI
ADV MET 1.1.4	Appreciate the effect and impact of wind.	3	Gusting, veering, backing *Optional content: land breezes, sea breezes, Föhn*	ADV ADI
ADV MET 1.1.5	Appreciate the effect and danger of hazardous meteorological phenomena.	3	Wind shear, turbulence, thunderstorms, icing, microbursts	ADV ADI
ADV MET 1.1.6	Appreciate the effect of a frontal system on aerodrome operations.	3		ADV ADI
ADV MET 1.1.7	Integrate data about meteorological phenomena into the provision of ATS.	4	Clearances, instructions and transmitted information *Optional content: relevant meteorological phenomena*	*ALL*

TOPIC MET 2 — SOURCES OF METEOROLOGICAL DATA				
Subtopic MET 2.1 — Meteorological instruments				
ADV MET 2.1.1	Extract information from meteorological instruments.	3	*Optional content: anemometer, RVR indicator, cloud base indicator, ceilometer, barometer*	ADV ADI
Subtopic MET 2.2 — Other sources of meteorological data				
ADV MET 2.2.1	Decode information from meteorological data displays.	3		ADV ADI
ADV MET 2.2.2	Use appropriate communication tools and networks to obtain meteorological data.	3		ADV ADI
ADV MET 2.2.3	Relay meteorological information.	3	ICAO Doc 4444, *Optional content: flight information centre, adjacent ATS unit, ADS-C reports*	*ALL*

SUBJECT 5: NAVIGATION

The subject objective is:

Learners shall analyse all navigational aspects in order to organise the traffic.

TOPIC NAV 1 — MAPS AND AERONAUTICAL CHARTS				
Subtopic NAV 1.1 — Maps and charts				
ADV NAV 1.1.1	Decode symbols and information displayed on aeronautical maps and charts.	3	Aerodrome charts *Optional content: visual approach/ departure charts, military maps and charts*	ADV
ADV NAV 1.1.2	Use relevant maps and charts.	3		ADV

TOPIC NAV 2 — INSTRUMENT NAVIGATION				
Subtopic NAV 2.1 — Navigational systems				
ADV NAV 2.1.1	Describe the possible operational status of navigational systems.	2	*Optional content: NDB, VOR, DME, GNSS*	ADV
ADV NAV 2.1.2	Decode operational status displays of navigational systems.	3	*Optional content: VDF, NDB, VOR, DME*	ADV
ADV NAV 2.1.3	Appreciate the effect of a change on the operational status of navigational systems	3	*Optional content: precision, limitations, status, degraded procedures*	*ALL*
Subtopic NAV 2.2 — Stabilised approach				
ADV NAV 2.2.1	Describe the concept of stabilised approach.	2	*Optional content: https://www.skybrary.aero*	ADV ADI APP APS
ADV NAV 2.2.2	Appreciate the effect of late change of runway-in-use for landing aircraft.	3	Cockpit workload *Optional content: impact on vertical profile (CDO), FMS management, crew procedure briefing, missed approach, loss of situational awareness, etc.*	ADV ADI

SUBJECT 6: AIRCRAFT

The subject objective is:

Learners shall assess and integrate aircraft performance in the provision of ATS.

TOPIC ACFT 1 — AIRCRAFT INSTRUMENTS				
Subtopic ACFT 1.1 — Aircraft instruments				
ADV ACFT 1.1.1	Integrate information from aircraft instruments provided by the pilot in the provision of ATS.	4		ALL
ADV ACFT 1.1.2	Explain the operation of aircraft radio equipment.	2	*Optional content: radios (number of), emergency radios*	ALL

TOPIC ACFT 2 — AIRCRAFT CATEGORIES				
Subtopic ACFT 2.1 — Wake turbulence				
ADV ACFT 2.1.1	Explain the wake turbulence effect and associated hazards to succeeding aircraft.	2		ALL
ADV ACFT 2.1.2	Appreciate the techniques used to prevent hazards associated with wake turbulence to succeeding aircraft.	3		ALL

TOPIC ACFT 3 — FACTORS AFFECTING AIRCRAFT PERFORMANCE				
Subtopic ACFT 3.1 — Take-off factors				
ADV ACFT 3.1.1	Integrate the influence of factors affecting aircraft on take-off.	4	*Optional content: runway conditions, runway slope, aerodrome elevation, wind, temperature, aircraft configuration, airframe contamination and aircraft mass*	ADV ADI
Subtopic ACFT 3.2 — Climb factors				
ADV ACFT 3.2.1	Appreciate the influence of factors affecting aircraft during climb.	3	*Optional content: speed, mass, air density, wind and temperature*	ADV ADI
Subtopic ACFT 3.3 — Final approach and landing factors				
ADV ACFT 3.3.1	Integrate the influence of factors affecting aircraft during final approach and landing.	4	*Optional content: wind, aircraft configuration, mass, runway conditions, runway slope, aerodrome elevation*	ADV ADI
Subtopic ACFT 3.4 — Economic factors				
ADV ACFT 3.4.1	Integrate consideration of economic factors affecting aircraft.	4	*Optional content: starting-up, taxiing, routing, departure sequence*	ADV ADI
Subtopic ACFT 3.5 — Environmental factors				
ADV ACFT 3.5.1	Appreciate the performance restrictions due to environmental constraints.	3	*Optional content: noise-abatement procedures, minimum flight altitudes, bird strike hazard*	ADV ADI

TOPIC ACFT 4 — AIRCRAFT DATA				
Subtopic ACFT 4.1 — Recognition of aircraft types				
ADV ACFT 4.1.1	Characterise a representative sample of aircraft which will be encountered in the operational/working environment.	2	Recognition, ICAO type designators, wake turbulence categories	ADV
Subtopic ACFT 4.2 — Performance data				
ADV ACFT 4.2.1	Integrate the average performance data of a representative sample of aircraft which will be encountered in the operational/ working environment into the provision of control service.	4	Performance data under a representative variety of circumstances	ADV ADI

SUBJECT 7: HUMAN FACTOR

The subject objective is:

Learners shall recognise the necessity to constantly extend their knowledge and analyse factors which affect personal and team performance.

TOPIC HUM 1 — PSYCHOLOGICAL FACTORS				
Subtopic HUM 1.1 — Cognitive				
ADV HUM 1.1.1	Describe the human information-processing model.	2	Attention, perception, memory, situational awareness, decision-making, response	ALL
ADV HUM 1.1.2	Describe the factors which influence human information-processing.	2	Confidence, stress, learning, knowledge, experience, fatigue, alcohol/drugs, distraction, interpersonal relations	ALL
ADV HUM 1.1.3	Monitor the effect of human information-processing factors on decision-making.	3	*Optional content: workload, stress, interpersonal relations, distraction, confidence*	ALL

TOPIC HUM 2 — MEDICAL AND PHYSIOLOGICAL FACTORS				
Subtopic HUM 2.1 — Fatigue				
ADV HUM 2.1.1	State the factors that cause fatigue.	1	Shift work *Optional content: night shifts and rosters, ICAO/IFATCA/CANSO's Fatigue Management Guide for Air Traffic Service Providers*	ALL
ADV HUM 2.1.2	Describe the onset of fatigue.	2	*Optional content: lack of concentration, listlessness, irritability, frustration, ICAO/IFATCA/CANSO's Fatigue Management Guide for Air Traffic Service Providers*	ALL
ADV HUM 2.1.3	Recognise the onset of fatigue in self.	1	*Optional content: ICAO/IFATCA/CANSO's Fatigue Management Guide for Air Traffic Service Providers*	ALL
ADV HUM 2.1.4	Recognise the onset of fatigue in others.	1		ALL
ADV HUM 2.1.5	Describe appropriate action when recognising fatigue.	2		ALL
Subtopic HUM 2.2 — Fitness				
ADV HUM 2.2.1	Recognise signs of lack of personal fitness.	1		ALL
ADV HUM 2.2.2	Describe actions when aware of a lack of personal fitness.	2		ALL

TOPIC HUM 3 — SOCIAL AND ORGANISATIONAL FACTORS				
Subtopic HUM 3.1 — Team resource management (TRM)				
ADV HUM 3.1.1	State the relevance of TRM.	1	*Optional content: TRM course, EUROCONTROL Guidelines for the development of TRM training*	ALL
ADV HUM 3.1.2	State the content of the TRM concept.	1	*Optional content: teamwork, human error, team roles, stress, decision-making, communication, situational awareness*	ALL
Subtopic HUM 3.2 — Teamwork and team roles				
ADV HUM 3.2.1	Identify reasons for conflict.	3		ALL
ADV HUM 3.2.2	Describe actions to prevent human conflicts.	2	*Optional content: TRM team roles*	ALL
ADV HUM 3.2.3	Describe strategies to cope with human conflicts.	2	*Optional content: in your team, in the simulator*	ALL
Subtopic HUM 3.3 — Responsible behaviour				
ADV HUM 3.3.1	Consider the factors which influence responsible behaviour.	2	*Optional content: situation, team, personal situation and judgement, instance of justification, moral motivation, personality*	ALL
ADV HUM 3.3.2	Apply responsible judgement.	3	Case study and discussion about a dilemma situation	ALL

TOPIC HUM 4 — STRESS				
Subtopic HUM 4.1 — Stress				
ADV HUM 4.1.1	Recognise the effects of stress on performance.	1	Stress and its symptoms in self and in others	ALL
Subtopic HUM 4.2 — Stress management				
ADV HUM 4.2.1	Act to reduce stress.	3	The effect of personality in coping with stress, the benefits of active stress management	ALL
ADV HUM 4.2.2	Respond to a stressful situation by offering, asking or accepting assistance.	3	*Optional content: the benefits of offering, accepting and asking for help in stressful situations*	ALL
ADV HUM 4.2.3	Recognise the effect of shocking and stressful events.	1	Self and others, abnormal situations, Critical Incident Stress Management (CISM)	ALL
ADV HUM 4.2.4	Consider the benefits of Critical Incident Stress Management (CISM).	2		ALL
ADV HUM 4.2.5	Explain procedures to be used following an incident/accident.	2	*Optional content: CISM, counselling, human element*	ALL

TOPIC HUM 5 — HUMAN ERROR				
Subtopic HUM 5.1 — Human error				
ADV HUM 5.1.1	Explain the relationship between error and safety.	2	Number and combination of errors, proactive versus reactive approach to discovery of error *Optional content: ICAO Circular 314 — AN/178 Threat and Error Management (TEM) in Air Traffic Control*	ALL
ADV HUM 5.1.2	Differentiate between the types of error.	2	Slips, lapses, mistakes *Optional content: ICAO Circular 314 — AN/178 Threat and Error Management (TEM) in Air Traffic Control*	ALL
ADV HUM 5.1.3	Describe error-prone conditions.	2	*Optional content: increase in traffic, changes in procedures, complexities of systems or traffic, weather, unusual occurrences*	ALL
ADV HUM 5.1.4	Collect examples of different error types, their causes and consequences for ATC.	3	*Optional content: ICAO Circular 314 — AN/178 Threat and Error Management (TEM) in Air Traffic Control*	ALL
ADV HUM 5.1.5	Explain how to detect errors to compensate for them.	2	STCA, MSAW, individual and collective strategy *Optional content: ICAO Circular 314 — AN/178 Threat and Error Management (TEM) in Air Traffic Control*	ALL
ADV HUM 5.1.6	Execute corrective actions.	3	Error compensation *Optional content: ICAO Circular 314 — AN/178 Threat and Error Management (TEM) in Air Traffic Control*	ALL
ADV HUM 5.1.7	Explain the importance of error management.	2	*Optional content: prevention of incidents, safety improvement, revision of procedures and/or working practices*	ALL
ADV HUM 5.1.8	Describe the impact on an ATCO's performance following an occurrence/incident.	2	*Optional content: reporting, SMS, investigation, CISM*	ALL
Subtopic HUM 5.2 — Violation of rules				
ADV HUM 5.2.1	Explain the causes and dangers of violation of rules becoming accepted as a practice.	2	*Optional content: ICAO Circular 314 — AN/178 Threat and Error Management (TEM) in Air Traffic Control*	ALL

TOPIC HUM 6 — COLLABORATIVE WORK				
Subtopic HUM 6.1 — Communication				
ADV HUM 6.1.1	Use communication effectively in ATC.	3		ALL
ADV HUM 6.1.2	Analyse examples of pilot–controller communication for effectiveness.	4		ALL
Subtopic HUM 6.2 — Collaborative work within the same area of responsibility				
ADV HUM 6.2.1	List communication means between controllers in charge of the same area of responsibility (sector or tower).	1	*Optional content: electronic, written, verbal and non-verbal communication*	ALL
ADV HUM 6.2.2	Explain consequences of the use of communication means on effectiveness.	2	*Optional content: strip legibility and encoding, label designation, feedback*	ALL
ADV HUM 6.2.3	List possible actions to provide a safe position handover.	1	*Optional content: rigour, preparation, overlap time*	ALL
ADV HUM 6.2.4	Explain consequences of a missed position handover process.	2		ALL
Subtopic HUM 6.3 — Collaborative work between different areas of responsibility				
ADV HUM 6.3.1	List factors and means for an effective coordination between sectors and/or tower positions.	1	*Optional content: other sectors' constraints, electronic coordination tools*	ALL
Subtopic HUM 6.4 — Controller–pilot cooperation				
ADV HUM 6.4.1	Describe parameters affecting controller–pilot cooperation.	2	*Optional content: workload, mutual knowledge, controller versus pilot mental picture*	ALL

SUBJECT 8: EQUIPMENT AND SYSTEMS

The subject objective is:

Learners shall integrate knowledge and understanding of the basic working principles of equipment and systems, and comply with the equipment and system degradation procedures in the provision of ATS.

TOPIC EQPS 1 — VOICE COMMUNICATIONS				
Subtopic EQPS 1.1 — Radio communications				
ADV EQPS 1.1.1	Operate two-way communication equipment.	3	Transmit/receive switches, procedures *Optional content: frequency selection, standby equipment*	ALL
ADV EQPS 1.1.2	Identify indications of operational status of radio equipment.	3	*Optional content: indicator lights, serviceability displays, selector/frequency displays*	ALL
Subtopic EQPS 1.2 — Other voice communications				
ADV EQPS 1.2.1	Operate landline communications.	3	*Optional content: telephone, interphone and intercom equipment*	ALL

TOPIC EQPS 2 — AUTOMATION IN ATS				
Subtopic EQPS 2.1 — Aeronautical fixed telecommunication network (AFTN)				
ADV EQPS 2.1.1	Decode AFTN messages.	3	*Optional content: movement and control messages, NOTAM, SNOWTAM, BIRDTAM, etc.*	ALL
Subtopic EQPS 2.2 — Automatic data interchange				
ADV EQPS 2.2.1	Use automatic data transfer equipment where available.	3	*Optional content: sequencing systems, automated information and coordination, OLDI*	ADV ADI APS ACS
ADV EQPS 2.2.2	Explain operational application of CPDLC for departure clearance (DCL) delivery and D-ATIS.	2	ICAO Doc 9694	ADV ADI

TOPIC EQPS 3 — CONTROLLER WORKING POSITION				
Subtopic EQPS 3.1 — Operation and monitoring of equipment				
ADV EQPS 3.1.1	Monitor the technical integrity of the controller working position.	3	Notification procedures, responsibilities	ALL
ADV EQPS 3.1.2	Operate the equipment of the controller working position.	3	*Optional content: situation displays, flight progress board, flight data display, radio, telephone, maps and charts, strip-printer, clock, information systems, UDF/VDF*	ALL
ADV EQPS 3.1.3	Operate available equipment in abnormal and emergency situations.	3		ALL
Subtopic EQPS 3.2 — Situation displays and information systems				
ADV EQPS 3.2.1	Use situation displays.	3		ALL

ADV EQPS 3.2.2	Check availability of information.	3		ALL
ADV EQPS 3.2.3	Obtain information from equipment.	3	*Optional content: information from wind direction indicator*	ADV ADI
Subtopic EQPS 3.3 — Flight data systems				
ADV EQPS 3.3.1	Use the flight data information at controller working position.	3		ALL
TOPIC EQPS 4 — FUTURE EQUIPMENT				
Subtopic EQPS 4.1 — New developments				
ADV EQPS 4.1.1	Recognise future developments.	1	New advanced systems	ALL
TOPIC EQPS 5 — EQUIPMENT AND SYSTEMS' LIMITATIONS AND DEGRADATION				
Subtopic EQPS 5.1 — Reaction to limitations				
ADV EQPS 5.1.1	Take account of the limitations of equipment and systems.	2		ALL
ADV EQPS 5.1.2	Respond to technical deficiencies of the operational position.	3	Notification procedures, responsibilities	ALL
Subtopic EQPS 5.2 — Communication equipment degradation				
ADV EQPS 5.2.1	Identify that communication equipment has degraded.	3	*Optional content: ground–air, ground–ground and landline communications*	ADV ADI
ADV EQPS 5.2.2	Apply contingency procedures in the event of communication equipment degradation.	4	*Optional content: total or partial degradation of ground–air and landline communications; alternative methods of transferring data*	ADV ADI
Subtopic EQPS 5.3 — Navigational equipment degradation				
ADV EQPS 5.3.1	Identify when a navigational equipment failure will affect operational ability.	3	*Optional content: VOR, navigational aids*	ALL

SUBJECT 9: PROFESSIONAL ENVIRONMENT

The subject objective is:

Learners shall identify the need for close cooperation with other parties concerning ATM operations and appreciate aspects of environmental protection.

TOPIC PEN 1 — FAMILIARISATION				
Subtopic PEN 1.1 — Study visit to aerodrome				
ADV PEN 1.1.1	Appreciate the functions and provision of operational aerodrome control services.	3	Study visit to TWR	ADV ADI

TOPIC PEN 2 — AIRSPACE USERS				
Subtopic PEN 2.1 — Contributors to civil ATS operations				
ADV PEN 2.1.1	Characterise civil ATS activities at aerodrome.	2	Study visit to TWR *Optional content: familiarisation visits to APP, ACC, AIS, RCC*	ADV ADI
ADV PEN 2.1.2	Characterise other parties interfacing with ATS operations.	2	*Optional content: familiarisation visits to engineering services, firefighting and emergency services, airline operations offices*	ALL
Subtopic PEN 2.2 — Contributors to military ATS operations				
ADV PEN 2.2.1	Characterise military ATS activities.	2	*Optional content: familiarisation visits to TWR, APP, ACC, AIS, RCC, Air Defence Units*	ALL

TOPIC PEN 3 — CUSTOMER RELATIONS				
Subtopic PEN 3.1 — Provision of services and user requirements				
ADV PEN 3.1.1	Identify the role of ATC as a service provider.	3		ALL
ADV PEN 3.1.2	Appreciate ATS users' requirements.	3		ALL

TOPIC PEN 4 — ENVIRONMENTAL PROTECTION				
Subtopic PEN 4.1 — Environmental protection				
ADV PEN 4.1.1	Describe the environmental constraints on aerodrome operations.	2	*Optional content: ICAO Circular 303 — Operational opportunities to minimise fuel use and reduce emissions*	ADV ADI APP APS
ADV PEN 4.1.2	Explain the use of Collaborative Environmental Management (CEM) process at aerodromes.	2		ADV ADI APP APS
ADV PEN 4.1.3	Appreciate the mitigation techniques used at aerodromes to minimise aviation's impact on the environment.	3	*Optional content: noise-abatement procedures, flight efficiency*	ADV ADI

SUBJECT 10: ABNORMAL AND EMERGENCY SITUATIONS

The subject objective is:

Learners shall develop a professional attitude to manage traffic in abnormal and emergency situations.

TOPIC ABES 1 — ABNORMAL AND EMERGENCY SITUATIONS (ABES)				
Subtopic ABES 1.1 — Overview of ABES				
ADV ABES 1.1.1	List common abnormal and emergency situations.	1	*Optional content: EATM Guidelines for Controller Training in the Handling of Unusual/Emergency Situations, ambulance flights, ground-based safety nets alerts, airframe failure, unreliable instruments, runway incursion*	ALL
ADV ABES 1.1.2	Identify potential or actual abnormal and emergency situations.	3		ALL
ADV ABES 1.1.3	Take into account the procedures for given abnormal and emergency situations.	2	Bird strike, aborted take-off *Optional content: ICAO Doc 4444*	ADV ADI
ADV ABES 1.1.4	Take into account that procedures do not exist for all abnormal and emergency situations.	2	*Optional content: real-life examples*	ALL
ADV ABES 1.1.5	Consider how the evolution of a situation may have an impact on safety.	2	*Optional content: separation, information, coordination*	ALL

TOPIC ABES 2 — SKILLS IMPROVEMENT				
Subtopic ABES 2.1 — Communication effectiveness				
ADV ABES 2.1.1	Ensure effective communication in all circumstances including the case where standard phraseology is not applicable.	4	Phraseology, vocabulary, readback, radio silence instruction	ALL
Subtopic ABES 2.2 — Avoidance of mental overload				
ADV ABES 2.2.1	Describe actions to keep the situation under control.	2	*Optional content: sector-splitting, holding, flow management, task delegation*	ALL
ADV ABES 2.2.2	Organise priority of actions.	4		ALL
ADV ABES 2.2.3	Ensure effective dissemination of information.	4	*Optional content: between executive and planner/coordinator, with the supervisor, between sectors, between ACC, APP and TWR , with ground staff, etc.*	ALL
ADV ABES 2.2.4	Consider asking for help.	2		ALL
Subtopic ABES 2.3 — Air–ground cooperation				
ADV ABES 2.3.1	Collect appropriate information relevant to the situation.	3		ALL

ADV ABES 2.3.2	Assist the pilot.	3	Pilot workload *Optional content: instructions, information, support, human factors, etc.*	ALL

TOPIC ABES 3 — PROCEDURES FOR ABNORMAL AND EMERGENCY SITUATIONS (ABES)				
Subtopic ABES 3.1 — Application of procedures for ABES				
ADV ABES 3.1.1	Apply the procedures for given abnormal and emergency situations.	3	*Optional content: EATM Guidelines for Controller Training in the Handling of Unusual/Emergency Situations, ambulance flights, ground-based safety nets alerts, airframe failure*	ALL
Subtopic ABES 3.2 — Radio failure				
ADV ABES 3.2.1	Describe the procedures to be followed by a pilot when that pilot experiences complete or partial radio failure.	2	*Optional content: ICAO Doc 4444, military procedures*	ALL
ADV ABES 3.2.2	Apply the procedures to be followed when a pilot experiences complete or partial radio failure.	3	*Optional content: prolonged loss of communication*	ALL
Subtopic ABES 3.3 — Unlawful interference and aircraft bomb threat				
ADV ABES 3.3.1	Apply ATC procedures associated with unlawful interference and aircraft bomb threat.	3		ALL
Subtopic ABES 3.4 — Strayed or unidentified aircraft				
ADV ABES 3.4.1	Apply the procedures in the case of strayed aircraft.	3	*Optional content: inside controlled airspace, outside controlled airspace*	ALL
ADV ABES 3.4.2	Apply the procedures in the case of unidentified aircraft.	3		ALL
ADV ABES 3.4.3	Provide navigational assistance to aircraft.	4	*Optional content: diverted aircraft, aircraft lost or unsure of position, information derived locally or from radar service or from other pilots, nearest most suitable aerodrome, track, heading, distance, aerodrome information, any other relevant navigational assistance, ICAO Doc 4444, etc.*	ADV ADI
Subtopic ABES 3.5 — Runway incursion				
ADV ABES 3.5.1	Apply ATC procedures associated with runway incursion.	3	ICAO Doc 4444	ADV ADI

SUBJECT 11: AERODROMES

The subject objective is:

Learners shall recognise and understand the design and layout of aerodromes.

TOPIC AGA 1 — AERODROME DATA, LAYOUT AND COORDINATION				
Subtopic AGA 1.1 — Definitions				
ADV AGA 1.1.1	Define aerodrome data.	1	*Optional content: aerodrome elevation, reference point, apron, movement area, manoeuvring area, hot spot*	ADV ADI APP APS
Subtopic AGA 1.2 — Coordination				
ADV AGA 1.2.1	Identify the information that has to be exchanged between Air Traffic Services (ATS) and the aerodrome authority.	3	Aerodrome conditions, fire/rescue category, condition of ground equipment and NAVAIDs, AIRAC	APP APS ADV ADI

TOPIC AGA 2 — MOVEMENT AREA				
Subtopic AGA 2.1 — Movement area				
ADV AGA 2.1.1	Describe movement area.	2		ADV ADI APP APS
ADV AGA 2.1.2	Describe the marking of obstacles and unusable or unserviceable areas.	2	Flags, signs on pavement, lights	ADV ADI APP APS
ADV AGA 2.1.3	Identify the information on conditions of the movement area that has to be passed on to aircraft.	3	Essential information on aerodrome conditions	ADV ADI APP APS
Subtopic AGA 2.2 — Manoeuvring area				
ADV AGA 2.2.1	Describe manoeuvring area.	2		ADV ADI APP APS
ADV AGA 2.2.2	Describe taxiway.	2		ADV ADI APP APS
ADV AGA 2.2.3	Describe daylight marking on taxiways.	2		ADV ADI APP APS
ADV AGA 2.2.4	Describe taxiway lighting.	2		ADV ADI APP APS

Subtopic AGA 2.3 — Runways				
ADV AGA 2.3.1	Describe runway.	2	Runway, runway surface, runway strip, shoulder, runway-end safety areas, clearways, stopways	ADV ADI APP APS
ADV AGA 2.3.2	Describe non-instrument runway.	2		ADV *ADI APP APS*
ADV AGA 2.3.3	Explain declared distances.	2	TORA, TODA, ASDA, LDA	ADV *ADI APP APS*
ADV AGA 2.3.4	Explain the differences between ACN and PCN.	2	Strength of pavements	ADV *ADI APP APS*
ADV AGA 2.3.5	Describe daylight markings on runways.	2	*Optional content: runway designator, centre line, threshold, aiming point, fixed distance, touchdown zone, side strip, colour*	ADV *ADI APP APS*
ADV AGA 2.3.6	Describe runway lights.	2	*Optional content: colour, centre line, intensity, edge, touchdown zone, threshold, barettes*	ADV *ADI APP APS*
ADV AGA 2.3.7	Explain the functions of visual landing aids.	2	*Optional content: AVASI, VASI, PAPI*	ADV *ADI APP APS*
ADV AGA 2.3.8	Describe the approach lighting systems.	2	Centre line, cross bars, stroboscopic lights, colours, intensity and brightness	ADV *ADI APP APS*
ADV AGA 2.3.9	Characterise the effect of water/ice on runways.	2		ADV *ADI APP APS*
ADV AGA 2.3.10	Explain braking action.	2	Braking action coefficient	ADV *ADI APP APS*
ADV AGA 2.3.11	Explain the effect of runway visual range on aerodrome operation.	2		ADV *ADI APP APS*

TOPIC AGA 3 — OBSTACLES				
Subtopic AGA 3.1 — Obstacle-free airspace around aerodromes				
ADV AGA 3.1.1	Explain the necessity for establishing and maintaining an obstacle-free airspace around aerodromes.	2		ADV ADI APP APS

TOPIC AGA 4 — MISCELLANEOUS EQUIPMENT				
Subtopic AGA 4.1 — Location				
ADV AGA 4.1.1	Explain the location of different aerodrome ground equipment.	2	*Optional content: LOC, GP, VDF, radio communication or ATS surveillance systems sensors, stopbars, AVASI, VASI, PAPI*	ADV ADI APP APS

AMC1 ATCO.D.010(a)(2)(ii) Composition of initial training

AERODROME CONTROL INSTRUMENT RATING FOR TOWER ADI (TWR) TRAINING — SUBJECT OBJECTIVES AND TRAINING OBJECTIVES

(a) The general principles that apply to this AMC are contained in AMC1 ATCO.D.010(a).

(b) The ATCO rating training Aerodrome Control Instrument Rating for Tower ADI (TWR) should contain the following subject objectives and training objectives that are associated with the subjects, topics and subtopics contained in Appendix 4 to TCAR PEL Part ATCO.

(c) Subjects, topics and subtopics from Appendix 4 to TCAR PEL Part ATCO are repeated in this AMC for the convenience of the reader and do not form part of it.

SUBJECT 1: INTRODUCTION TO THE COURSE

The subject objective is:

Learners shall know and understand the training programme that they will follow and learn how to obtain the appropriate information.

TOPIC INTR 1 — COURSE MANAGEMENT				
Subtopic INTR 1.1 — Course introduction				
ADI (TWR) INTR 1.1.1	Explain the aims and main objectives of the course.	2		ALL
Subtopic INTR 1.2 — Course administration				
ADI (TWR) INTR 1.2.1	State how the course is administered.	1		ALL
Subtopic INTR 1.3 — Study material and training documentation				
ADI (TWR) INTR 1.3.1	Use appropriate documents and their sources for course studies.	3	*Optional content: training documentation, library, CBT library, web, learning management server*	ALL
ADI (TWR) INTR 1.3.2	Integrate appropriate information into course studies.	4	Training documentation *Optional content: supplementary information, library*	ALL

TOPIC INTR 2 — INTRODUCTION TO THE ATC TRAINING COURSE				
Subtopic INTR 2.1 — Course content and organisation				
ADI (TWR) INTR 2.1.1	State the different training methods used during the course.	1	Theoretical training, practical training, self-study, types of training events	ALL
ADI (TWR) INTR 2.1.2	State the subjects covered by the course and their purpose.	1		ALL
ADI (TWR) INTR 2.1.3	Describe the organisation of theoretical training.	2	*Optional content: course programme*	ALL

ADI (TWR) INTR 2.1.4	Describe the organisation of practical training.	2	*Optional content: PTP, simulation, briefing, debriefing, course programme*	ALL
Subtopic INTR 2.2 — Training ethos				
ADI (TWR) INTR 2.2.1	Recognise the feedback mechanisms available.	1	Training progress, assessment, briefing, debriefing, learner–instructor feedback, instructor–instructor feedback	ALL
Subtopic INTR 2.3 — Assessment process				
ADI (TWR) INTR 2.3.1	Describe the assessment process.	2		ALL

SUBJECT 2: AVIATION LAW

The subject objective is:

Learners shall know, understand and apply the Rules of the Air and the Regulations regarding reporting and airspace, and appreciate the Licensing and Competence principles.

TOPIC LAW 1 — ATCO LICENSING/CERTIFICATE OF COMPETENCE				
Subtopic LAW 1.1 — Privileges and conditions				
ADI (TWR) LAW 1.1.1	Appreciate the conditions which shall be met to issue an Aerodrome Control Instrument rating with Tower Control endorsement.	3	Relevant national regulation on ATCO Licensing *Optional content: national documents*	ADI
ADI (TWR) LAW 1.1.2	Explain how to maintain and update professional knowledge and skills to retain competence in the operational environment.	2		ALL
ADI (TWR) LAW 1.1.3	Explain the conditions for suspension/revocation of an ATCO licence.	2	Relevant national regulation on ATCO Licensing	ALL

TOPIC LAW 2 — RULES AND REGULATIONS				
Subtopic LAW 2.1 — Reports				
ADI (TWR) LAW 2.1.1	List the standard forms for reports.	1	Air traffic incident report *Optional content: routine air-reports, breach of regulations, watchbook/logbook, records*	ALL
ADI (TWR) LAW 2.1.2	Describe the functions of, and processes for, reporting.	2	Reporting culture, air traffic incident report *Optional content: breach of regulations, watchbook/logbook, records, voluntary reporting*	ALL
ADI (TWR) LAW 2.1.3	Use forms for reporting.	3	air traffic incident reporting form(s) *Optional content: routine air-reports, breach of regulations, watchbook/logbook, records*	ALL

Subtopic LAW 2.2 — Airspace				
ADI (TWR) LAW 2.2.1	Appreciate airspace classes and structure and their relevance to operations using the Aerodrome Control Instrument rating with Tower Control endorsement.	3		ADI
ADI (TWR) LAW 2.2.2	Provide planning, coordination and control actions appropriate to the classification and structure of airspace.	4	*Optional content: international requirements, civil requirements, military requirements, areas of responsibility, sectorisation, national requirements*	ALL
ADI (TWR) LAW 2.2.3	Appreciate responsibility for terrain clearance.	3		ALL
TOPIC LAW 3 — ATC SAFETY MANAGEMENT				
Subtopic LAW 3.1 — Feedback process				
ADI (TWR) LAW 3.1.1	State the importance of controller contribution to the feedback process.	1	*Optional content: voluntary reporting*	ALL
ADI (TWR) LAW 3.1.2	Describe how reported occurrences are analysed.	2	Relevant national regulations *Optional content: local procedures*	ALL
ADI (TWR) LAW 3.1.3	Name the means used to disseminate recommendations.	1	*Optional content: safety letters, safety boards web pages*	ALL
ADI (TWR) LAW 3.1.4	Appreciate the 'Just Culture' concept.	3	Benefits, prerequisites, constraints *Optional content:* *https://www.skybrary.aero*	ALL
Subtopic LAW 3.2 — Safety Investigation				
ADI (TWR) LAW 3.2.1	Describe role and mission of Safety Investigation in the improvement of safety.	2		ALL
ADI (TWR) LAW 3.2.2	Define working methods of Safety Investigation.	1		ALL

SUBJECT 3: AIR TRAFFIC MANAGEMENT

The subject objective is:

Learners shall manage air traffic to ensure safe, orderly and expeditious services.

TOPIC ATM 1 — PROVISION OF SERVICES				
Subtopic ATM 1.1 — Aerodrome control service				
ADI (TWR) ATM 1.1.1	Appreciate areas of responsibility.	3	Control zone, traffic circuit, manoeuvring area, movement area, vicinity *Optional content: ATZ*	ADV ADI
ADI (TWR) ATM 1.1.2	Provide aerodrome control service.	4	ICAO Annex 11, ICAO Doc 7030, ICAO Doc 4444, operation manuals	ADV ADI
Subtopic ATM 1.2 — Flight information service (FIS)				
ADI (TWR) ATM 1.2.1	Describe the information that shall be passed on to aircraft by an aerodrome controller.	2	ICAO Doc 4444	ADV ADI
ADI (TWR) ATM 1.2.2	Provide FIS.	4	ICAO Doc 4444, *Optional content: national documents*	*ALL*
ADI (TWR) ATM 1.2.3	Issue appropriate information.	3	ICAO Doc 4444, essential local traffic, traffic information	ADV ADI
ADI (TWR) ATM 1.2.4	Appreciate the use of ATIS in the provision of flight information service.	3		ADV ADI
Subtopic ATM 1.3 — Alerting service (ALRS)				
ADI (TWR) ATM 1.3.1	Provide ALRS.	4	ICAO Doc 4444, *Optional content: national documents*	ALL
ADI (TWR) ATM 1.3.2	Respond to distress and urgency messages and signals.	3	ICAO Annex 10, ICAO Doc 4444 *Optional content: EUROCONTROL Guidelines for Controller Training in the Handling of Unusual/Emergency Situations*	ALL
Subtopic ATM 1.4 — ATS system capacity and air traffic flow management				
ADI (TWR) ATM 1.4.1	Appreciate the impact of ATS system capacity and air traffic flow management on the controller.	3	*Optional content: slot management, slot allocation procedures, local implementation of ATFCM principles, etc.*	ADV ADI
ADI (TWR) ATM 1.4.2	Organise traffic to take account of flow management.	4	*Optional content: departure sequence*	ADV ADI
ADI (TWR) ATM 1.4.3	Inform the appropriate authority of local factors affecting ATS system capacity and air traffic flow management.	3	*Optional content: abnormal situations, decrease in sector capacity, limitations on systems and equipment, changes in workload/capacity, unusual meteorological conditions, relevant information: reported ground-based incidents, forest fire, smoke, oil pollution*	ADV ADI

TOPIC ATM 2 — COMMUNICATION				
Subtopic ATM 2.1 — Effective communication				
ADI (TWR) ATM 2.1.1	Use approved phraseology.	3	ICAO Doc 4444 and ICAO Doc 9432	ALL
ADI (TWR) ATM 2.1.2	Ensure effective communication.	4	Communication techniques, readback/verification of readback	ALL

TOPIC ATM 3 — ATC CLEARANCES AND ATC INSTRUCTIONS				
Subtopic ATM 3.1 — ATC clearances				
ADI (TWR) ATM 3.1.1	Issue appropriate ATC clearances.	3	*Optional content: ICAO Doc 4444, national documents*	ALL
ADI (TWR) ATM 3.1.2	Integrate appropriate ATC clearances in control service.	4		ALL
ADI (TWR) ATM 3.1.3	Ensure the agreed course of action is carried out.	4		ALL
Subtopic ATM 3.2 — ATC instructions				
ADI (TWR) ATM 3.2.1	Issue appropriate ATC instructions.	3	ICAO Doc 4444 *Optional content: national documents*	ALL
ADI (TWR) ATM 3.2.2	Integrate appropriate ATC instructions in control service.	4		ALL
ADI (TWR) ATM 3.2.3	Ensure the agreed course of action is carried out.	4		ALL

TOPIC ATM 4 — COORDINATION				
Subtopic ATM 4.1 — Necessity for coordination				
ADI (TWR) ATM 4.1.1	Identify the need for coordination.	3		ALL
Subtopic ATM 4.2 — Tools and methods for coordination				
ADI (TWR) ATM 4.2.1	Use the available tools for coordination.	3	*Optional content: electronic transfer of flight data, telephone, interphone, intercom, direct speech, radiotelephone (RTF), local agreements, automated system coordination*	ALL
Subtopic ATM 4.3 — Coordination procedures				
ADI (TWR) ATM 4.3.1	Initiate appropriate coordination.	3	Delegation/transfer of responsibility for air–ground communications and separation, transfer of control, etc., ICAO Doc 4444 *Optional content: release point*	ALL

ADI (TWR) ATM 4.3.2	Analyse effect of coordination requested by an adjacent position/unit.	4	*Optional content: delegation/transfer of responsibility for air–ground communications and separation, release point, transfer of control, etc.*	ALL
ADI (TWR) ATM 4.3.3	Select, after negotiation, an appropriate course of action.	5		ALL
ADI (TWR) ATM 4.3.4	Ensure the agreed course of action is carried out.	4		ALL
ADI (TWR) ATM 4.3.5	Coordinate when providing FIS.	4	ICAO Doc 4444	ALL
ADI (TWR) ATM 4.3.6	Coordinate when providing ALRS.	4	ICAO Doc 4444	ALL
TOPIC ATM 5 — ALTIMETRY AND LEVEL ALLOCATION				
Subtopic ATM 5.1 — Altimetry				
ADI (TWR) ATM 5.1.1	Allocate levels according to altimetry data.	4		ALL
ADI (TWR) ATM 5.1.2	Ensure separation according to altimetry data.	4	*Optional content: transition level, transition altitude, transition layer, height, flight level, altitude, vertical distance to airspace boundaries*	ALL
Subtopic ATM 5.2 — Terrain clearance				
ADI (TWR) ATM 5.2.1	Provide planning, coordination and control actions appropriate to the rules for minimum safe height and terrain clearance.	4	*Optional content: terrain clearance dimensions, minimum safe altitudes, transition level, minimum flight level, minimum sector altitude*	ADI
TOPIC ATM 6 — SEPARATIONS				
Subtopic ATM 6.1 — Separation between departing aircraft				
ADI (TWR) ATM 6.1.1	Provide separation between departing aircraft.	4	ICAO Doc 4444	ADV ADI
Subtopic ATM 6.2 — Separation of departing aircraft from arriving aircraft				
ADI (TWR) ATM 6.2.1	Provide separation of departing aircraft from arriving aircraft.	4	ICAO Doc 4444	ADI
Subtopic ATM 6.3 — Separation of landing aircraft and preceding landing or departing aircraft				
ADI (TWR) ATM 6.3.1	Provide separation of landing aircraft and preceding landing or departing aircraft.	4	ICAO Doc 4444	*ADV* ADI
Subtopic ATM 6.4 — Time-based wake turbulence longitudinal separation				
ADI (TWR) ATM 6.4.1	Provide time-based wake turbulence longitudinal separation.	4	ICAO Doc 4444	ADI *ADV*

Subtopic ATM 6.5 — Reduced separation minima				
ADI (TWR) ATM 6.5.1	Provide reduced separation minima.	4	ICAO Doc 4444	ADI *ADV*
TOPIC ATM 7 — AIRBORNE COLLISION AVOIDANCE SYSTEMS AND GROUND-BASED SAFETY NETS				
Subtopic ATM 7.1 — Airborne collision avoidance systems				
ADI (TWR) ATM 7.1.1	Differentiate between ACAS advisory thresholds and aerodrome separation standards.	2	ICAO Doc 9863	ADV ADI
ADI (TWR) ATM 7.1.2	Describe the controller responsibility during and following an ACAS RA reported by pilot.	2	ICAO Doc 4444	ALL
ADI (TWR) ATM 7.1.3	Respond to pilot notification of actions based on airborne systems warnings.	3	TAWS *Optional content: ACAS*	ALL
Subtopic ATM 7.2 — Ground-based safety nets				
ADI (TWR) ATM 7.2.1	Respond to available ground-based safety nets warnings.	3	*Optional content: anti-incursion*	ADV ADI
TOPIC ATM 8 — DATA DISPLAY				
Subtopic ATM 8.1 — Data management				
ADI (TWR) ATM 8.1.1	Update the data display to accurately reflect the traffic situation.	3	*Optional content: information displayed, strip-marking procedures, electronic information data displays, actions based on traffic display information, calculation of EETs*	ALL
ADI (TWR) ATM 8.1.2	Analyse pertinent data on data displays.	4		ALL
ADI (TWR) ATM 8.1.3	Organise pertinent data on data displays.	4		ALL
ADI (TWR) ATM 8.1.4	Obtain flight plan information.	3	CPL, FPL, supplementary information *Optional content: RPL, AFIL, etc.*	ALL
ADI (TWR) ATM 8.1.5	Use flight plan information.	3		ALL
TOPIC ATM 9 — OPERATIONAL ENVIRONMENT (SIMULATED)				
Subtopic ATM 9.1 — Integrity of the operational environment				
ADI (TWR) ATM 9.1.1	Obtain information concerning the operational environment.	3	*Optional content: briefing, notices, local orders, verification of information*	ALL
ADI (TWR) ATM 9.1.2	Ensure the integrity of the operational environment.	4	*Optional content: frequency, VOLMET, ATIS, SIGMET, systems' set-up, integrity of displays*	ADV ADI

Subtopic ATM 9.2 — Verification of the currency of operational procedures				
ADI (TWR) ATM 9.2.1	Check all relevant documentation before managing traffic.	3	*Optional content: briefing, letters of agreement (LoAs), NOTAMs, AICs*	ALL
Subtopic ATM 9.3 — Handover–takeover				
ADI (TWR) ATM 9.3.1	Transfer information to the relieving controller.	3		ALL
ADI (TWR) ATM 9.3.2	Obtain information from the controller handing over.	3		ALL

TOPIC ATM 10 — PROVISION OF AN AERODROME CONTROL SERVICE				
Subtopic ATM 10.1 — Responsibility for the provision				
ADI (TWR) ATM 10.1.1	Explain the responsibility for the provision of an aerodrome control service.	2	ICAO Doc 4444	ADV ADI
ADI (TWR) ATM 10.1.2	Describe the division of responsibility among air traffic control units.	2	ICAO Doc 4444	*ALL*
ADI (TWR) ATM 10.1.3	Describe the responsibility in regard to military traffic.	2	ICAO Doc 4444 *Optional content: ICAO Doc 9554*	*ALL*
ADI (TWR) ATM 10.1.4	Describe the responsibility in regard to unmanned free balloons.	2		ADV ADI
ADI (TWR) ATM 10.1.5	Appreciate the influence of operational requirements.	3	*Optional content: military flying, calibration flights, aerial photography*	*ALL*
Subtopic ATM 10.2 — Functions of aerodrome control tower				
ADI (TWR) ATM 10.2.1	Manage the general functions of aerodrome control.	4	ICAO Doc 4444	ADV ADI
ADI (TWR) ATM 10.2.2	Manage the suspension of VFR operations.	4	ICAO Doc 4444	ADV ADI
Subtopic ATM 10.3 — Traffic management process				
ADI (TWR) ATM 10.3.1	Ensure that situational awareness is maintained.	4	Information gathering, observation, traffic projection	ADV ADI
ADI (TWR) ATM 10.3.2	Detect conflicts in time for appropriate resolution.	4		ALL
ADI (TWR) ATM 10.3.3	Identify potential solutions to achieve a safe and effective flow of aerodrome traffic.	3		ADV ADI
ADI (TWR) ATM 10.3.4	Evaluate possible outcomes of different control actions.	5		ADV ADI

ADI (TWR) ATM 10.3.5	Select an appropriate plan in time to achieve safe and effective flow of aerodrome traffic.	5		ADV ADI
ADI (TWR) ATM 10.3.6	Ensure an adequate priority of actions.	4		ALL
ADI (TWR) ATM 10.3.7	Execute plan in a timely manner.	3		ADV ADI
ADI (TWR) ATM 10.3.8	Ensure a safe and efficient outcome is achieved.	4	Traffic monitoring, adaptability and follow-up	ALL
Subtopic ATM 10.4 — Aeronautical ground lights				
ADI (TWR) ATM 10.4.1	Select appropriate aeronautical ground lights.	5	ICAO Doc 4444	ADV ADI
Subtopic ATM 10.5 — Information to aircraft by aerodrome control tower				
ADI (TWR) ATM 10.5.1	Provide information related to the operation of aircraft.	4	ICAO Doc 4444,	ADV ADI
ADI (TWR) ATM 10.5.2	Provide information on aerodrome conditions.	4	ICAO Doc 4444,	ADV ADI
Subtopic ATM 10.6 — Control of aerodrome traffic				
ADI (TWR) ATM 10.6.1	Predict positions of aircraft in the aerodrome traffic and taxi circuits.	4	ICAO Doc 4444	ADV ADI
ADI (TWR) ATM 10.6.2	Manage traffic on the manoeuvring area.	4	ICAO Doc 4444, aircraft, vehicles *Optional content: runway inspection*	ADV ADI
ADI (TWR) ATM 10.6.3	Manage traffic in accordance with a change to operational procedures.	4	*Optional content: taxiway closure*	ADV ADI
ADI (TWR) ATM 10.6.4	Balance the workload against personal capacity.	5	*Optional content: replanning, prioritising solutions, denying requests, delaying traffic*	ADV ADI
Subtopic ATM 10.7 — Control of traffic in the traffic circuit				
ADI (TWR) ATM 10.7.1	Manage traffic in the traffic circuit.	4	ICAO Doc 4444, meteorological phenomena, geographical knowledge, environmental factors	ADV ADI
ADI (TWR) ATM 10.7.2	Manage arriving and departing traffic.	4	ICAO Doc 4444, allocation of the order of priority, meteorological phenomena, wake turbulence, environmental factors	ADV ADI
ADI (TWR) ATM 10.7.3	Integrate the serviceability of radio aids in the management of aerodrome traffic.	4	*Optional content: UDF, VDF, ILS, NDB, VOR, DME*	ADV ADI

ADI (TWR) ATM 10.7.4	Integrate surface conditions into the control of aerodrome traffic.	4	*Optional content: damp, wet, water patches, flooding, snow, slush, ice, braking action*	ADV ADI
ADI (TWR) ATM 10.7.5	Integrate information about meteorological phenomena into the control of aerodrome traffic.	4	*Optional content: clouds, precipitation, visibility, wind, meteorological hazards*	ADV ADI
ADI (TWR) ATM 10.7.6	Integrate the information provided by situation displays.	4	Use, advantages, disadvantages	ADV ADI
ADI (TWR) ATM 10.7.7	Initiate missed approach.	3	*Optional content: obstructed runway*	ADV ADI
Subtopic ATM 10.8 — Runway in use				
ADI (TWR) ATM 10.8.1	Select the runway in use.	5	ICAO Doc 4444,	ADV ADI
ADI (TWR) ATM 10.8.2	Coordinate runway in use.	4	*Optional content: approach control, area control, runway selection, change of runway*	ADV ADI
ADI (TWR) ATM 10.8.3	Manage traffic in the event of runway-in-use change.	4	*Optional content: https://www.skybrary.aero*	ADV ADI
TOPIC ATM 11 — PROVISION OF AERODROME CONTROL — INSTRUMENT				
Subtopic ATM 11.1 — Low-visibility operations and special VFR				
ADI (TWR) ATM 11.1.1	Manage SVFR traffic.	4	ICAO Doc 4444	*ADV* ADI
ADI (TWR) ATM 11.1.2	Describe the procedures for low-visibility operations.	2	ICAO Doc 4444	ADI
Subtopic ATM 11.2 — Departing traffic				
ADI (TWR) ATM 11.2.1	Manage control of departing aircraft.	4	ICAO Doc 4444, use of situation displays, wake turbulence, appropriate departure clearances, SIDs	ADI
ADI (TWR) ATM 11.2.2	Integrate departure sequence into the control of aerodrome traffic.	4	ICAO Doc 4444,	ADI
ADI (TWR) ATM 11.2.3	Provide appropriate information to departing traffic.	4	ICAO Doc 4444, use of situation displays, wake turbulence	ADI
Subtopic ATM 11.3 — Arriving traffic				
ADI (TWR) ATM 11.3.1	Manage control of arriving aircraft.	4	ICAO Doc 4444, wake turbulence	ADI
ADI (TWR) ATM 11.3.2	Integrate the approach sequence into the control of aerodrome traffic.	4	ICAO Doc 4444,	ADI

ADI (TWR) ATM 11.3.3	Integrate aircraft on visual approach into the aerodrome traffic.	4	ICAO Doc 4444,	ADI
ADI (TWR) ATM 11.3.4	Integrate aircraft on missed approach into the aerodrome traffic.	4	Use of air traffic monitors	ADI
ADI (TWR) ATM 11.3.5	Integrate aircraft performing circling approach into the aerodrome traffic.	4	ICAO Doc 8168 Volume II	ADI
ADI (TWR) ATM 11.3.6	Provide appropriate information to arriving aircraft.	4	ICAO Doc 4444,	ADI
Subtopic ATM 11.4 — Aerodrome control service with advanced system support				
ADI (TWR) ATM 11.4.1	Appreciate the impact of advanced systems on the provision of aerodrome control service.	3	*Optional content: surface manager (SMAN), departure manager (DMAN), automated conflicts/incursions tools, alarms and resolution advisory tools, automated assistance for surface movement planning and routing, enhanced vision technology in low visibility for controllers*	ADI

SUBJECT 4: METEOROLOGY

The subject objective is:

Learners shall acquire, decode and make proper use of meteorological information relevant to the provision of ATS.

TOPIC MET 1 — METEOROLOGICAL PHENOMENA				
Subtopic MET 1.1 — Meteorological phenomena				
ADI (TWR) MET 1.1.1	Appreciate the impact of different cloud types.	3	Cumulus, cumulonimbus *Optional content: stratus, nimbostratus, etc.*	ADV ADI
ADI (TWR) MET 1.1.2	Appreciate the impact of precipitation.	3	Precipitation and microphysics *Optional content: rain, snow, sleet, hail*	ADV ADI
ADI (TWR) MET 1.1.3	Appreciate the impact of atmospheric obscurity.	3	*Optional content: advection fog, radiation fog, mixing, evaporation, mist, drizzle*	ADV ADI
ADI (TWR) MET 1.1.4	Appreciate the effect and impact of wind.	3	Gusting, veering, backing *Optional content: land breezes, sea breezes*	ADV ADI
ADI (TWR) MET 1.1.5	Appreciate the effect and danger of hazardous meteorological phenomena.	3	Wind shear, turbulence, thunderstorms, icing, microbursts	ADV ADI
ADI (TWR) MET 1.1.6	Appreciate the effect of a frontal system on aerodrome operations.	3		ADV ADI
ADI (TWR) MET 1.1.7	Integrate data about meteorological phenomena into the provision of ATS.	4	Clearances, instructions and transmitted information *Optional content: relevant meteorological phenomena*	*ALL*

TOPIC MET 2 — SOURCES OF METEOROLOGICAL DATA				
Subtopic MET 2.1 — Meteorological instruments				
ADI (TWR) MET 2.1.1	Extract information from meteorological instruments.	3	*Optional content: anemometer, RVR indicator, cloud base indicator, ceilometer, barometer*	ADV ADI
Subtopic MET 2.2 — Other sources of meteorological data				
ADI (TWR) MET 2.2.1	Decode information from meteorological data displays.	3		ADV ADI
ADI (TWR) MET 2.2.2	Use appropriate communication tools and networks to obtain meteorological data.	3		ADV ADI
ADI (TWR) MET 2.2.3	Relay meteorological information.	3	ICAO Doc 4444, *Optional content: flight information centre, adjacent ATS unit, ADS-C reports*	*ALL*

SUBJECT 5: NAVIGATION

The subject objective is:

Learners shall analyse all navigational aspects in order to organise the traffic.

TOPIC NAV 1 — MAPS AND AERONAUTICAL CHARTS				
Subtopic NAV 1.1 — Maps and charts				
ADI (TWR) NAV 1.1.1	Decode symbols and information displayed on aeronautical maps and charts.	3	Instrument approach charts, SID charts, aerodrome charts *Optional content: visual approach charts, military maps and charts*	ADI APP APS
ADI (TWR) NAV 1.1.2	Use relevant maps and charts.	3		ADI

TOPIC NAV 2 — INSTRUMENT NAVIGATION				
Subtopic NAV 2.1 — Navigational systems				
ADI (TWR) NAV 2.1.1	Describe how the operational status of navigational systems may change.	2	*Optional content: VDF, NDB, VOR, DME, ILS, ABAS, SBAS, GBAS, RNP*	ADI
ADI (TWR) NAV 2.1.2	Decode operational status displays of navigational systems.	3	*Optional content: VDF, NDB, VOR, DME, ILS and GBAS*	ADI
ADI (TWR) NAV 2.1.3	Appreciate the effect of a change on the operational status of navigational systems.	3	*Optional content: precision, limitations, status, degraded procedures*	*ALL*
ADI (TWR) NAV 2.1.4	Manage traffic in case of change in the operational status of navigational systems.	4	*Optional content: limitations, availability and status of ground-based and satellite-based systems*	ADI
Subtopic NAV 2.2 — Stabilised approach				
ADI (TWR) NAV 2.2.1	Describe the concept of stabilised approach.	2	*Optional content:* https://www.skybrary.aero	ADV ADI APP APS
ADI (TWR) NAV 2.2.2	Appreciate the effect of late change of runway-in-use for landing aircraft.	3	Cockpit workload *Optional content: impact on vertical profile (CDO), FMS management, crew procedure briefing, missed approach, loss of situational awareness, etc.*	ADV ADI
Subtopic NAV 2.3 — Instrument departures and arrivals				
ADI (TWR) NAV 2.3.1	Describe relevant SIDs.	2		ADI APP APS
ADI (TWR) NAV 2.3.2	Describe the phases of an instrument approach procedure.	2		ADI
ADI (TWR) NAV 2.3.3	Describe the relevant minima applicable for a precision/non-precision and visual approach.	2	*Optional content: Type A/B operations, CAT I/II/III criteria, LNAV, LNAV/VNAV, LPV, RNP AR APCH minima*	ADI APP APS

TOPIC NAV 2 — INSTRUMENT NAVIGATION				
Subtopic NAV 2.4 — Satellite-based systems				
ADI (TWR) NAV 2.4.1	State the different applications of satellite-based systems relevant for aerodrome operations.	1	*Optional content: LNAV, LNAV/VNAV, LPV, RNP minima, precision approach*	ADI
Subtopic NAV 2.5 — PBN applications				
ADI (TWR) NAV 2.5.1	State future PBN developments.	1	A-RNP, RNP (AR) DEP *Optional content: RNP 3D, VNAV, 4D, TBO*	ADI *APP* *ACP* *APS* *ACS*

SUBJECT 6: AIRCRAFT

The subject objective is:

Learners shall assess and integrate aircraft performance in the provision of ATS.

TOPIC ACFT 1 — AIRCRAFT INSTRUMENTS				
Subtopic ACFT 1.1 — Aircraft instruments				
ADI (TWR) ACFT 1.1.1	Integrate information from aircraft instruments provided by the pilot in the provision of ATS.	4		ALL
ADI (TWR) ACFT 1.1.2	Explain the operation of aircraft radio equipment.	2	*Optional content: radios (number of), emergency radios*	ALL
ADI (TWR) ACFT 1.1.3	Explain the operation of on-board surveillance equipment.	2	Transponders: equipment Mode A, Mode C, Mode S, ADS capability	ADI APS ACS

TOPIC ACFT 2 — AIRCRAFT CATEGORIES				
Subtopic ACFT 2.1 — Wake turbulence				
ADI (TWR) ACFT 2.1.1	Explain the wake turbulence effect and associated hazards to succeeding aircraft.	2		ALL
ADI (TWR) ACFT 2.1.2	Appreciate the techniques used to prevent hazards associated with wake turbulence to succeeding aircraft.	3		ALL
Subtopic ACFT 2.2 — Application of ICAO approach categories				
ADI (TWR) ACFT 2.2.1	Describe the use of ICAO approach categories.	2	ICAO Doc 8168	ADI APP APS
ADI (TWR) ACFT 2.2.2	Appreciate the effect of ICAO approach categories on the organisation of traffic.	3		ADI APP APS

TOPIC ACFT 3 — FACTORS AFFECTING AIRCRAFT PERFORMANCE				
Subtopic ACFT 3.1 — Take-off factors				
ADI (TWR) ACFT 3.1.1	Integrate the influence of factors affecting aircraft on take-off.	4	*Optional content: runway conditions, runway slope, aerodrome elevation, wind, temperature, aircraft configuration, airframe contamination and aircraft mass*	ADV ADI
Subtopic ACFT 3.2 — Climb factors				
ADI (TWR) ACFT 3.2.1	Appreciate the influence of factors affecting aircraft during climb.	3	*Optional content: speed, mass, air density, wind and temperature*	ADV ADI
Subtopic ACFT 3.3 — Final approach and landing factors				
ADI (TWR) ACFT 3.3.1	Integrate the influence of factors affecting aircraft during final approach and landing.	4	*Optional content: wind, aircraft configuration, mass, runway conditions, runway slope, aerodrome elevation*	ADV ADI

Subtopic ACFT 3.4 — Economic factors				
ADI (TWR) ACFT 3.4.1	Integrate consideration of economic factors affecting aircraft.	4	*Optional content: starting-up, taxiing, routing, departure sequence*	ADV ADI
Subtopic ACFT 3.5 — Environmental factors				
ADI (TWR) ACFT 3.5.1	Appreciate the performance restrictions due to environmental constraints.	3	*Optional content: noise-abatement procedures, minimum flight altitudes, bird strike hazard*	ADV ADI
TOPIC ACFT 4 — AIRCRAFT DATA				
Subtopic ACFT 4.1 — Recognition of aircraft types				
ADI (TWR) ACFT 4.1.1	Characterise a representative sample of aircraft which will be encountered in the operational/working environment.	2	Recognition, ICAO type designators, wake turbulence categories *Optional content: ICAO approach categories*	ADI
Subtopic ACFT 4.2 — Performance data				
ADI (TWR) ACFT 4.2.1	Integrate the average performance data of a representative sample of aircraft which will be encountered in the operational/ working environment into the provision of control service.	4	Performance data under a representative variety of circumstances	ADV ADI

SUBJECT 7: HUMAN FACTORS

The subject objective is:

Learners shall recognise the necessity to constantly extend their knowledge and analyse factors which affect personal and team performance.

TOPIC HUM 1 — PSYCHOLOGICAL FACTORS				
Subtopic HUM 1.1 — Cognitive				
ADI (TWR) HUM 1.1.1	Describe the human information-processing model.	2	Attention, perception, memory, situational awareness, decision-making, response	ALL
ADI (TWR) HUM 1.1.2	Describe the factors which influence human information-processing.	2	Confidence, stress, learning, knowledge, experience, fatigue, alcohol/drugs, distraction, interpersonal relations	ALL
ADI (TWR) HUM 1.1.3	Monitor the effect of human information-processing factors on decision-making.	3	*Optional content: workload, stress, interpersonal relations, distraction, confidence*	ALL

TOPIC HUM 2 — MEDICAL AND PHYSIOLOGICAL FACTORS				
Subtopic HUM 2.1 — Fatigue				
ADI (TWR) HUM 2.1.1	State factors that cause fatigue.	1	Shift work *Optional content: night shifts and rosters, ICAO/IFATCA/CANSO's Fatigue Management Guide for Air Traffic Service Providers*	ALL
ADI (TWR) HUM 2.1.2	Describe the onset of fatigue.	2	*Optional content: lack of concentration, listlessness, irritability, frustration, ICAO/IFATCA/CANSO's Fatigue Management Guide for Air Traffic Service Providers*	ALL
ADI (TWR) HUM 2.1.3	Recognise the onset of fatigue in self.	1	*Optional content: ICAO/IFATCA/CANSO's Fatigue Management Guide for Air Traffic Service Providers*	ALL
ADI (TWR) HUM 2.1.4	Recognise the onset of fatigue in others.	1		ALL
ADI (TWR) HUM 2.1.5	Describe appropriate action when recognising fatigue.	2		ALL
Subtopic HUM 2.2 — Fitness				
ADI (TWR) HUM 2.2.1	Recognise signs of lack of personal fitness.	1		ALL
ADI (TWR) HUM 2.2.2	Describe actions when aware of a lack of personal fitness.	2		ALL

TOPIC HUM 3 — SOCIAL AND ORGANISATIONAL FACTORS				
Subtopic HUM 3.1 — Team resource management (TRM)				
ADI (TWR) HUM 3.1.1	State the relevance of TRM.	1	*Optional content: TRM course, EUROCONTROL Guidelines for the development of TRM training*	ALL
ADI (TWR) HUM 3.1.2	State the content of the TRM concept.	1	*Optional content: teamwork, human error, team roles, stress, decision-making, communication, situational awareness*	ALL
Subtopic HUM 3.2 — Teamwork and team roles				
ADI (TWR) HUM 3.2.1	Identify reasons for conflict.	3		ALL
ADI (TWR) HUM 3.2.2	Describe actions to prevent human conflicts.	2	*Optional content: TRM team roles*	ALL
ADI (TWR) HUM 3.2.3	Describe strategies to cope with human conflicts.	2	*Optional content: in your team, in the simulator*	ALL
Subtopic HUM 3.3 — Responsible behaviour				
ADI (TWR) HUM 3.3.1	Consider the factors which influence responsible behaviour.	2	*Optional content: situation, team, personal situation and judgement, instance of justification, moral motivation, personality*	ALL
ADI (TWR) HUM 3.3.2	Apply responsible judgement.	3	Case study and discussion about a dilemma situation	ALL

TOPIC HUM 4 — STRESS				
Subtopic HUM 4.1 — Stress				
ADI (TWR) HUM 4.1.1	Recognise the effects of stress on performance.	1	Stress and its symptoms in self and in others	ALL
Subtopic HUM 4.2 — Stress management				
ADI (TWR) HUM 4.2.1	Act to reduce stress.	3	The effect of personality in coping with stress, the benefits of active stress management	ALL
ADI (TWR) HUM 4.2.2	Respond to stressful situations by offering, asking or accepting assistance.	3	*Optional content: the benefits of offering, accepting and asking for help in stressful situations*	ALL
ADI (TWR) HUM 4.2.3	Recognise the effect of shocking and stressful events.	1	Self and others, abnormal situations, Critical Incident Stress Management (CISM)	ALL
ADI (TWR) HUM 4.2.4	Consider the benefits of Critical Incident Stress Management (CISM).	2		ALL
ADI (TWR) HUM 4.2.5	Explain procedures to be used following an incident/accident.	2	*Optional content: CISM, counselling, human element*	ALL

TOPIC HUM 5 — HUMAN ERROR				
Subtopic HUM 5.1 — Human error				
ADI (TWR) HUM 5.1.1	Explain the relationship between error and safety.	2	Number and combination of errors, proactive versus reactive approach to discovery of error *Optional content: ICAO Circular 314 — AN/178 Threat and Error Management (TEM) in Air Traffic Control*	ALL
ADI (TWR) HUM 5.1.2	Differentiate between the types of error.	2	Slips, lapses, mistakes *Optional content: ICAO Circular 314 — AN/178 Threat and Error Management (TEM) in Air Traffic Control*	ALL
ADI (TWR) HUM 5.1.3	Describe error-prone conditions.	2	*Optional content: increase in traffic, changes in procedures, complexities of systems or traffic, weather, unusual occurrences*	ALL
ADI (TWR) HUM 5.1.4	Collect examples of different error types, their causes and consequences for ATC.	3	*Optional content: ICAO Circular 314 — AN/178 Threat and Error Management (TEM) in Air Traffic Control*	ALL
ADI (TWR) HUM 5.1.5	Explain how to detect errors to compensate for them.	2	STCA, MSAW, individual and collective strategy *Optional content: ICAO Circular 314 — AN/178 Threat and Error Management (TEM) in Air Traffic Control*	ALL
ADI (TWR) HUM 5.1.6	Execute corrective actions.	3	Error compensation *Optional content: ICAO Circular 314 — AN/178 Threat and Error Management (TEM) in Air Traffic Control*	ALL
ADI (TWR) HUM 5.1.7	Explain the importance of error management.	2	*Optional content: prevention of incidents, safety improvement, revision of procedures and/or working practices*	ALL
ADI (TWR) HUM 5.1.8	Describe the impact on an ATCO's performance following an occurrence/incident.	2	*Optional content: reporting, SMS, investigation, CISM*	ALL
Subtopic HUM 5.2 — Violation of rules				
ADI (TWR) HUM 5.2.1	Explain the causes and dangers of violation of rules becoming accepted as a practice.	2	*Optional content: ICAO Circular 314 — AN/178 Threat and Error Management (TEM) in Air Traffic Control*	ALL

TOPIC HUM 6 — COLLABORATIVE WORK				
Subtopic HUM 6.1 — Communication				
ADI (TWR) HUM 6.1.1	Use communication effectively in ATC.	3		ALL
ADI (TWR) HUM 6.1.2	Analyse examples of pilot–controller communication for effectiveness.	4		ALL

Subtopic HUM 6.2 — Collaborative work within the same area of responsibility				
ADI (TWR) HUM 6.2.1	List communication means between controllers in charge of the same area of responsibility (sector or tower).	1	*Optional content: electronic, written, verbal and non-verbal communication*	ALL
ADI (TWR) HUM 6.2.2	Explain consequences of the use of communication means on effectiveness.	2	*Optional content: strip legibility and encoding, label designation, feedback*	ALL
ADI (TWR) HUM 6.2.3	List possible actions to provide a safe position handover.	1	*Optional content: rigour, preparation, overlap time*	ALL
ADI (TWR) HUM 6.2.4	Explain consequences of a missed position handover process.	2		ALL
Subtopic HUM 6.3 — Collaborative work between different areas of responsibility				
ADI (TWR) HUM 6.3.1	List factors and means for an effective coordination between sectors and/or tower positions.	1	*Optional content: other sectors' constraints, electronic coordination tools*	ALL
Subtopic HUM 6.4 — Controller–pilot cooperation				
ADI (TWR) HUM 6.4.1	Describe parameters affecting controller–pilot cooperation.	2	*Optional content: workload, mutual knowledge, controller versus pilot mental picture*	ALL

SUBJECT 8: EQUIPMENT AND SYSTEMS

The subject objective is:

Learners shall integrate knowledge and understanding of the basic working principles of equipment and systems, and comply with the equipment and system degradation procedures in the provision of ATS.

TOPIC EQPS 1 — VOICE COMMUNICATIONS				
Subtopic EQPS 1.1 — Radio communications				
ADI (TWR) EQPS 1.1.1	Operate two-way communication equipment.	3	Transmit/receive switches, procedures *Optional content: frequency selection, standby equipment*	ALL
ADI (TWR) EQPS 1.1.2	Identify indications of operational status of radio equipment.	3	*Optional content: indicator lights, serviceability displays, selector/frequency displays*	ALL
Subtopic EQPS 1.2 — Other voice communications				
ADI (TWR) EQPS 1.2.1	Operate landline communications.	3	*Optional content: telephone, interphone and intercom equipment*	ALL

TOPIC EQPS 2 — AUTOMATION IN ATS				
Subtopic EQPS 2.1 — Aeronautical fixed telecommunication network (AFTN)				
ADI (TWR) EQPS 2.1.1	Decode AFTN messages.	3	*Optional content: movement and control messages, NOTAMs, SNOWTAMs, BIRDTAMs, etc.*	ALL
Subtopic EQPS 2.2 — Automatic data interchange				
ADI (TWR) EQPS 2.2.1	Use automatic data transfer equipment where available.	3	*Optional content: sequencing systems, automated information and coordination, OLDI*	ADV ADI APS ACS
ADI (TWR) EQPS 2.2.2	Explain operational application of CPDLC for departure clearance (DCL) delivery and D-ATIS.	2	ICAO Doc 9694	ADV ADI

TOPIC EQPS 3 — CONTROLLER WORKING POSITION				
Subtopic EQPS 3.1 — Operation and monitoring of equipment				
ADI (TWR) EQPS 3.1.1	Monitor the technical integrity of the controller working position.	3	Notification procedures, responsibilities	ALL
ADI (TWR) EQPS 3.1.2	Operate the equipment of the controller working position.	3	*Optional content: situation displays, flight progress board, flight data display, radio, telephone, maps and charts, strip-printer, clock, information systems, UDF/VDF*	ALL
ADI (TWR) EQPS 3.1.3	Operate available equipment in abnormal and emergency situations.	3		ALL
Subtopic EQPS 3.2 — Situation displays and information systems				
ADI (TWR) EQPS 3.2.1	Use situation displays.	3		ALL

ADI (TWR) EQPS 3.2.2	Check availability of information.	3		ALL
ADI (TWR) EQPS 3.2.3	Obtain information from equipment.	3	*Optional content: information from wind direction indicator*	ADV ADI
ADI (TWR) EQPS 3.2.4	Take account of anti-incursion equipment.	2		ADI
ADI (TWR) EQPS 3.2.5	Explain the use of ASMGCS.	2		ADI
Subtopic EQPS 3.3 — Flight data systems				
ADI (TWR) EQPS 3.3.1	Use the flight data information at controller working position.	3		ALL

TOPIC EQPS 4 — FUTURE EQUIPMENT				
Subtopic EQPS 4.1 — New developments				
ADI (TWR) EQPS 4.1.1	Recognise future developments.	1	New advanced systems	ALL

TOPIC EQPS 5 — EQUIPMENT AND SYSTEMS' LIMITATIONS AND DEGRADATION				
Subtopic EQPS 5.1 — Reaction to limitations				
ADI (TWR) EQPS 5.1.1	Take account of the limitations of equipment and systems.	2		ALL
ADI (TWR) EQPS 5.1.2	Respond to technical deficiencies of the operational position.	3	Notification procedures, responsibilities	ALL
Subtopic EQPS 5.2 — Communication equipment degradation				
ADI (TWR) EQPS 5.2.1	Identify that communication equipment has degraded.	3	*Optional content: ground–air, ground–ground and landline communications*	ADV ADI
ADI (TWR) EQPS 5.2.2	Apply contingency procedures in the event of communication equipment degradation.	4	*Optional content: total or partial degradation of ground–air and landline communications; alternative methods of transferring data*	ADV ADI
Subtopic EQPS 5.3 — Navigational equipment degradation				
ADI (TWR) EQPS 5.3.1	Identify when a navigational equipment failure will affect operational ability.	3	*Optional content: VOR, navigational aids*	ALL
ADI (TWR) EQPS 5.3.2	Apply contingency procedures in the event of a navigational equipment degradation.	3	*Optional content: vertical separation, information to aircraft, navigational assistance, seeking assistance from adjacent units*	ADI APP ACP APS ACS

SUBJECT 9: PROFESSIONAL ENVIRONMENT

The subject objective is:

Learners shall identify the need for close cooperation with other parties concerning ATM operations and appreciate aspects of environmental protection.

TOPIC PEN 1 — FAMILIARISATION				
Subtopic PEN 1.1 — Study visit to aerodrome				
ADI (TWR) PEN 1.1.1	Appreciate the functions and provision of operational aerodrome control services.	3	Study visit to TWR	ADV ADI

TOPIC PEN 2 — AIRSPACE USERS				
Subtopic PEN 2.1 — Contributors to civil ATS operations				
ADI (TWR) PEN 2.1.1	Characterise civil ATS activities at aerodrome.	2	Study visit to TWR *Optional content: familiarisation visits to APP, ACC, AIS, RCC*	ADV ADI
ADI (TWR) PEN 2.1.2	Characterise other parties interfacing with ATS operations.	2	*Optional content: familiarisation visits to engineering services, firefighting and emergency services, airline operations offices*	ALL
Subtopic PEN 2.2 — Contributors to military ATS operations				
ADI (TWR) PEN 2.2.1	Characterise military ATS activities.	2	*Optional content: familiarisation visits to TWR, APP, ACC, AIS, RCC, Air Defence Units*	ALL

TOPIC PEN 3 — CUSTOMER RELATIONS				
Subtopic PEN 3.1 — Provision of services and user requirements				
ADI (TWR) PEN 3.1.1	Identify the role of ATC as a service provider.	3		ALL
ADI (TWR) PEN 3.1.2	Appreciate ATS users' requirements.	3		ALL

TOPIC PEN 4 — ENVIRONMENTAL PROTECTION				
Subtopic PEN 4.1 — Environmental protection				
ADI (TWR) PEN 4.1.1	Describe the environmental constraints on aerodrome operations.	2	*Optional content: ICAO Circular 303 — Operational opportunities to minimise fuel use and reduce emissions*	ADV ADI APP APS
ADI (TWR) PEN 4.1.2	Explain the use of Collaborative Environmental Management (CEM) process at aerodromes.	2		ADV ADI APP APS
ADI (TWR) PEN 4.1.3	Appreciate the mitigation techniques used at aerodromes to minimise aviation's impact on the environment.	3	*Optional content: noise-abatement procedures, flight efficiency*	ADV ADI

SUBJECT 10: ABNORMAL AND EMERGENCY SITUATIONS

The subject objective is:

Learners shall develop a professional attitude to manage traffic in abnormal and emergency situations.

TOPIC ABES 1 — ABNORMAL AND EMERGENCY SITUATIONS (ABES)				
Subtopic ABES 1.1 — Overview of ABES				
ADI (TWR) ABES 1.1.1	List common abnormal and emergency situations.	1	*Optional content: EATM Guidelines for Controller Training in the Handling of Unusual/Emergency Situations, ambulance flights, ground-based safety nets alerts, airframe failure, unreliable instruments, runway incursion*	ALL
ADI (TWR) ABES 1.1.2	Identify potential or actual abnormal and emergency situations.	3		ALL
ADI (TWR) ABES 1.1.3	Take into account the procedures for given abnormal and emergency situations.	2	Bird strike, aborted take-off *Optional content: ICAO Doc 4444*	ADV ADI
ADI (TWR) ABES 1.1.4	Take into account that procedures do not exist for all abnormal and emergency situations.	2	*Optional content: real-life examples*	ALL
ADI (TWR) ABES 1.1.5	Consider how the evolution of a situation may have an impact on safety.	2	*Optional content: separation, information, coordination*	ALL

TOPIC ABES 2 — SKILLS IMPROVEMENT				
Subtopic ABES 2.1 — Communication effectiveness				
ADI (TWR) ABES 2.1.1	Ensure effective communication in all circumstances including the case where standard phraseology is not applicable.	4	Phraseology, vocabulary, readback, radio silence instruction	ALL
Subtopic ABES 2.2 — Avoidance of mental overload				
ADI (TWR) ABES 2.2.1	Describe actions to keep the situation under control.	2	*Optional content: sector-splitting, holding, flow management, task delegation*	ALL
ADI (TWR) ABES 2.2.2	Organise priority of actions.	4		ALL
ADI (TWR) ABES 2.2.3	Ensure effective dissemination of information.	4	*Optional content: between executive and planner/coordinator, with the supervisor, between sectors, between ACC, APP and TWR, with ground staff, etc.*	ALL
ADI (TWR) ABES 2.2.4	Consider asking for help.	2		ALL
Subtopic ABES 2.3 — Air–ground cooperation				
ADI (TWR) ABES 2.3.1	Collect appropriate information relevant to the situation.	3		ALL
ADI (TWR) ABES 2.3.2	Assist the pilot.	3	Pilot workload *Optional content: instructions, information,*	ALL

TOPIC ABES 3 — PROCEDURES FOR ABNORMAL AND EMERGENCY SITUATIONS (ABES)				
Subtopic ABES 3.1 — Application of procedures for ABES				
ADI (TWR) ABES 3.1.1	Apply the procedures for given abnormal and emergency situations.	3	*Optional content: EATM Guidelines for Controller Training in the Handling of Unusual/Emergency Situations, ambulance flights, ground-based safety nets alerts, airframe failure*	ALL
Subtopic ABES 3.2 — Radio failure				
ADI (TWR) ABES 3.2.1	Describe the procedures to be followed by a pilot when that pilot experiences complete or partial radio failure.	2	*Optional content: ICAO Doc 4444, military procedures*	ALL
ADI (TWR) ABES 3.2.2	Apply the procedures to be followed when a pilot experiences complete or partial radio failure.	3	*Optional content: prolonged loss of communication*	ALL
Subtopic ABES 3.3 — Unlawful interference and aircraft bomb threat				
ADI (TWR) ABES 3.3.1	Apply ATC procedures associated with unlawful interference and aircraft bomb threat.	3		ALL
Subtopic ABES 3.4 — Strayed or unidentified aircraft				
ADI (TWR) ABES 3.4.1	Apply the procedures in the case of strayed aircraft.	3	*Optional content: inside controlled airspace, outside controlled airspace*	ALL
ADI (TWR) ABES 3.4.2	Apply the procedures in the case of unidentified aircraft.	3		ALL
ADI (TWR) ABES 3.4.3	Provide navigational assistance to aircraft.	4	*Optional content: diverted aircraft, aircraft lost or unsure of position, information derived locally or from radar service or from other pilots, nearest most suitable aerodrome, track, heading, distance, aerodrome information, any other relevant navigational assistance, ICAO Doc 4444, etc.*	ADV ADI
Subtopic ABES 3.5 — Runway incursion				
ADI (TWR) ABES 3.5.1	Apply ATC procedures associated with runway incursion.	3	ICAO Doc 4444	ADV ADI

SUBJECT 11: AERODROMES

The subject objective is:

Learners shall recognise and understand the design and layout of aerodromes.

TOPIC AGA 1 — AERODROME DATA, LAYOUT AND COORDINATION				
Subtopic AGA 1.1 — Definitions				
ADI (TWR) AGA 1.1.1	Define aerodrome data.	1	*Optional content: aerodrome elevation, reference point, apron, movement area, manoeuvring area, hot spot*	ADV ADI APP APS
Subtopic AGA 1.2 — Coordination				
ADI (TWR) AGA 1.2.1	Identify the information that has to be exchanged between Air Traffic Services (ATS) and the aerodrome authority.	3	Aerodrome conditions, fire/rescue category, condition of ground equipment and NAVAIDs, AIRAC	APP APS ADV ADI

TOPIC AGA 2 — MOVEMENT AREA				
Subtopic AGA 2.1 — Movement area				
ADI (TWR) AGA 2.1.1	Describe movement area.	2		ADV ADI APP APS
ADI (TWR) AGA 2.1.2	Describe the marking of obstacles and unusable or unserviceable areas.	2	Flags, signs on pavement, lights	ADV ADI APP APS
ADI (TWR) AGA 2.1.3	Identify the information on conditions of the movement area that has to be passed on to aircraft.	3	Essential information on aerodrome conditions	ADV ADI APP APS
Subtopic AGA 2.2 — Manoeuvring area				
ADI (TWR) AGA 2.2.1	Describe manoeuvring area.	2		ADV ADI APP APS
ADI (TWR) AGA 2.2.2	Describe taxiway.	2		ADV ADI APP APS
ADI (TWR) AGA 2.2.3	Describe daylight marking on taxiways.	2		ADV ADI APP APS
ADI (TWR) AGA 2.2.4	Describe taxiway lighting.	2		ADV ADI APP APS

Subtopic AGA 2.3 — Runways				
ADI (TWR) AGA 2.3.1	Describe runway.	2	Runway, runway surface, runway strip, shoulder, runway-end safety areas, clearways, stopways	ADV ADI APP APS
ADI (TWR) AGA 2.3.2	Describe instrument runway.	2		ADI APP APS
ADI (TWR) AGA 2.3.3	Describe non-instrument runway.	2		*ADV* ADI APP APS
ADI (TWR) AGA 2.3.4	Explain declared distances.	2	TORA, TODA, ASDA, LDA	*ADV* ADI APP APS
ADI (TWR) AGA 2.3.5	Explain the differences between ACN and PCN.	2	Strength of pavements	*ADV* ADI APP APS
ADI (TWR) AGA 2.3.6	Describe the daylight markings on runways.	2	*Optional content: runway designator, centre line, threshold, aiming point, fixed distance, touchdown zone, side strip, colour*	*ADV* ADI APP APS
ADI (TWR) AGA 2.3.7	Describe runway lights.	2	*Optional content: colour, centre line, intensity, edge, touchdown zone, threshold, barettes*	*ADV* ADI APP APS
ADI (TWR) AGA 2.3.8	Explain the functions of visual landing aids.	2	*Optional content: AVASI, VASI, PAPI*	*ADV* ADI APP APS
ADI (TWR) AGA 2.3.9	Describe the approach lighting systems.	2	Centre line, cross bars, stroboscopic lights, colours, intensity and brightness	*ADV* ADI APP APS
ADI (TWR) AGA 2.3.10	Characterise the effect of water/ice on runways.	2		*ADV* ADI APP APS
ADI (TWR) AGA 2.3.11	Explain braking action.	2	Braking action coefficient	*ADV* ADI APP APS
ADI (TWR) AGA 2.3.12	Explain the effect of runway visual range on aerodrome operation.	2		*ADV* ADI APP APS

TOPIC AGA 3 — OBSTACLES				
Subtopic AGA 3.1 — Obstacle-free airspace around aerodromes				
ADI (TWR) AGA 3.1.1	Explain the necessity for establishing and maintaining an obstacle-free airspace around aerodromes.	2		ADV ADI APP APS

TOPIC AGA 4 — MISCELLANEOUS EQUIPMENT				
Subtopic AGA 4.1 — Location				
ADI (TWR) AGA 4.1.1	Explain the location of different aerodrome ground equipment.	2	*Optional content: LOC, GP, VDF, radio communication or ATS surveillance systems sensors, stopbars, AVASI, VASI, PAPI*	ADV ADI APP APS

AMC1 ATCO.D.010(a)(2)(iii) Composition of initial training

APPROACH CONTROL PROCEDURAL RATING (APP) TRAINING — SUBJECT OBJECTIVES AND TRAINING OBJECTIVES

(a) The general principles that apply to this AMC are contained in AMC1 ATCO.D.010(a).

(b) The ATCO rating training Approach Control Procedural Rating (APP) should contain the following subject objectives and training objectives that are associated with the subjects, topics and subtopics contained in Appendix 5 to TCAR PEL Part ATCO.

(c) Subjects, topics and subtopics from Appendix 5 to TCAR PEL Part ATCO are repeated in this AMC for the convenience of the reader and do not form part of it.

SUBJECT 1: INTRODUCTION TO THE COURSE

The subject objective is:

Learners shall know and understand the training programme that they will follow and learn how to obtain the appropriate information.

TOPIC INTR 1 — COURSE MANAGEMENT				
Subtopic INTR 1.1 — Course introduction				
APP INTR 1.1.1	Explain the aims and main objectives of the course.	2		ALL
Subtopic INTR 1.2 — Course administration				
APP INTR 1.2.1	State how the course is administered.	1		ALL
Subtopic INTR 1.3 — Study material and training documentation				
APP INTR 1.3.1	Use appropriate documents and their sources for course studies.	3	*Optional content: training documentation, library, CBT library, web, learning management server*	ALL
APP INTR 1.3.2	Integrate appropriate information into course studies.	4	Training documentation *Optional content: supplementary information, library*	ALL

TOPIC INTR 2 — INTRODUCTION TO THE ATC TRAINING COURSE				
Subtopic INTR 2.1 — Course content and organisation				
APP INTR 2.1.1	State the different training methods used during the course.	1	Theoretical training, practical training, self-study, types of training events	ALL
APP INTR 2.1.2	State the subjects covered by the course and their purpose.	1		ALL
APP INTR 2.1.3	Describe the organisation of theoretical training.	2	*Optional content: course programme*	ALL

APP INTR 2.1.4	Describe the organisation of practical training.	2	*Optional content: PTP, simulation, briefing, debriefing, course programme*	ALL
Subtopic INTR 2.2 — Training ethos				
APP INTR 2.2.1	Recognise the feedback mechanisms available.	1	Training progress, assessment, briefing, debriefing, learner–instructor feedback, instructor–instructor feedback	ALL
Subtopic INTR 2.3 — Assessment process				
APP INTR 2.3.1	Describe the assessment process.	2		ALL

SUBJECT 2: AVIATION LAW

The subject objective is:

Learners shall know, understand and apply the Rules of the Air and the Regulations regarding reporting and airspace, and appreciate the Licensing and Competence principles.

TOPIC LAW 1 — ATCO LICENSING/CERTIFICATE OF COMPETENCE				
Subtopic LAW 1.1 — Privileges and conditions				
APP LAW 1.1.1	Appreciate the conditions which shall be met to issue an Approach Control Procedural rating.	3	Relevant national regulation on ATCO Licensing *Optional content: national documents*	APP
APP LAW 1.1.2	Explain how to maintain and update professional knowledge and skills to retain competence in the operational environment.	2		ALL
APP LAW 1.1.3	Explain the conditions for suspension/revocation of an ATCO licence.	2	Relevant national regulation on ATCO Licensing	ALL

TOPIC LAW 2 — RULES AND REGULATIONS				
Subtopic LAW 2.1 — Reports				
APP LAW 2.1.1	List the standard forms for reports.	1	Air traffic incident report *Optional content: routine air-reports, breach of regulations, watchbook/logbook, records*	ALL
APP LAW 2.1.2	Describe the functions of, and processes for, reporting.	2	Reporting culture, air traffic incident report *Optional content: breach of regulations, watchbook/logbook, records, voluntary reporting*	ALL
APP LAW 2.1.3	Use forms for reporting.	3	air traffic incident reporting form(s) *Optional content: routine air-reports, breach of regulations, watchbook/logbook, records*	ALL
Subtopic LAW 2.2 — Airspace				
APP LAW 2.2.1	Appreciate airspace classes and structure and their relevance to operations using the Approach Control Procedural rating.	3		APP
APP LAW 2.2.2	Provide planning, coordination and control actions appropriate to the classification and structure of airspace.	4	*Optional content: international requirements, civil requirements, military requirements, areas of responsibility, sectorisation, national requirements*	ALL
APP LAW 2.2.3	Appreciate responsibility for terrain clearance.	3		ALL

TOPIC LAW 3 — ATC SAFETY MANAGEMENT				
Subtopic LAW 3.1 — Feedback process				
APP LAW 3.1.1	State the importance of controller contribution to the feedback process.	1	*Optional content: voluntary reporting*	ALL
APP LAW 3.1.2	Describe how reported occurrences are analysed.	2	Relevant national regulations *Optional content: local procedures*	ALL
APP LAW 3.1.3	Name the means used to disseminate recommendations.	1	*Optional content: safety letters, safety boards web pages*	ALL
APP LAW 3.1.4	Appreciate the 'Just Culture' concept.	3	Benefits, prerequisites, constraints *Optional content:* *https://www.skybrary.aero*	ALL
Subtopic LAW 3.2 — Safety Investigation				
APP LAW 3.2.1	Describe role and mission of Safety Investigation in the improvement of safety.	2		ALL
APP LAW 3.2.2	Define working methods of Safety Investigation.	1		ALL

SUBJECT 3: AIR TRAFFIC MANAGEMENT

The subject objective is:

Learners shall manage air traffic to ensure safe, orderly and expeditious services.

TOPIC ATM 1 — PROVISION OF SERVICES				
Subtopic ATM 1.1 — Air traffic control (ATC) service				
APP ATM 1.1.1	Appreciate own area of responsibility.	3		APP ACP APS ACS
APP ATM 1.1.2	Provide approach control service.	4	ICAO Annex 11, ICAO Doc 7030, ICAO Doc 4444, operation manuals	APP APS
Subtopic ATM 1.2 — Flight information service (FIS)				
APP ATM 1.2.1	Provide FIS.	4	ICAO Doc 4444, *Optional content: national documents*	*ALL*
APP ATM 1.2.2	Issue appropriate information concerning the position of conflicting traffic.	3	ICAO Doc 4444, traffic information, essential traffic information	APP ACP *APS* *ACS*
APP ATM 1.2.3	Appreciate the use of ATIS in the provision of flight information service.	3		APP *APS*
Subtopic ATM 1.3 — Alerting service (ALRS)				
APP ATM 1.3.1	Provide ALRS.	4	ICAO Doc 4444, *Optional content: national documents*	ALL
APP ATM 1.3.2	Respond to distress and urgency messages and signals.	3	ICAO Annex 10, ICAO Doc 4444 *Optional content: EUROCONTROL Guidelines for Controller Training in the Handling of Unusual/Emergency Situations*	ALL
Subtopic ATM 1.4 — ATS system capacity and air traffic flow management				
APP ATM 1.4.1	Appreciate the impact of ATS system capacity and air traffic flow management on the controller.	3	*Optional content: slot management, slot allocation procedures, local implementation of ATFCM principles, etc.*	APP ACP APS ACS
APP ATM 1.4.2	Apply flow management procedures in the provision of ATC.	3	*Optional content: EUROCONTROL ATFCM Users Manual*	APP ACP APS ACS
APP ATM 1.4.3	Organise traffic flows and patterns to take account of airspace boundaries.	4	*Optional content: civil and military, controlled, uncontrolled, advisory, restricted, danger, prohibited, special rules, sector boundaries, national boundaries, FIR boundaries, delegated airspace, transfer of control, transfer of communications, en-route, off-route*	APP ACP APS ACS

TOPIC ATM 1 — PROVISION OF SERVICES				
APP ATM 1.4.4	Organise traffic flows and patterns to take account of areas of responsibility.	4	*Optional content: EUROCONTROL ATFCM Users Manual*	APP ACP APS ACS
APP ATM 1.4.5	Inform supervisor of local factors affecting ATS system capacity and air traffic flow management.	3	*Optional content: abnormal situations, decrease in sector capacity, limitations on systems and equipment, changes in workload/capacity, unusual meteorological conditions, relevant information like: reported ground-based incidents, forest fire, smoke, oil pollution*	APP ACP APS ACS
Subtopic ATM 1.5 — Airspace management (ASM)				
APP ATM 1.5.1	Appreciate the impact of ASM on the controller.	3	*Optional content: FABs, EUROCONTROL Specification for the application of FUA, TSAs, CDRs, CBAs, free route airspace*	APP ACP APS ACS
APP ATM 1.5.2	Organise traffic to take account of ASM.	4	*Optional content: CDR, TSA, TRA, CBA, real-time activation, deactivation or reallocation of airspace*	APP ACP

TOPIC ATM 2 — COMMUNICATION				
Subtopic ATM 2.1 — Effective communication				
APP ATM 2.1.1	Use approved phraseology.	3	ICAO Doc 4444 and ICAO Doc 9432	ALL
APP ATM 2.1.2	Ensure effective communication.	4	Communication techniques, readback/verification of readback	ALL

TOPIC ATM 3 — ATC CLEARANCES AND ATC INSTRUCTIONS				
Subtopic ATM 3.1 — ATC clearances				
APP ATM 3.1.1	Issue appropriate ATC clearances.	3	*Optional content: ICAO Doc 4444, national documents*	ALL
APP ATM 3.1.2	Integrate appropriate ATC clearances in control service.	4		ALL
APP ATM 3.1.3	Ensure the agreed course of action is carried out.	4		ALL
Subtopic ATM 3.2 — ATC instructions				
APP ATM 3.2.1	Issue appropriate ATC instructions.	3	ICAO Doc 4444 *Optional content: national documents*	ALL
APP ATM 3.2.2	Integrate appropriate ATC instructions in control service.	4		ALL
APP ATM 3.2.3	Ensure the agreed course of action is carried out.	4		ALL

TOPIC ATM 4 — COORDINATION				
Subtopic ATM 4.1 — Necessity for coordination				
APP ATM 4.1.1	Identify the need for coordination.	3		ALL
Subtopic ATM 4.2 — Tools and methods for coordination				
APP ATM 4.2.1	Use the available tools for coordination.	3	*Optional content: electronic transfer of flight data, telephone, interphone, intercom, direct speech, radiotelephone (RTF), local agreements, automated system coordination*	ALL
Subtopic ATM 4.3 — Coordination procedures				
APP ATM 4.3.1	Initiate appropriate coordination.	3	Delegation/transfer of responsibility for air–ground communications and separation, transfer of control, etc., ICAO Doc 4444 *Optional content: release point*	ALL
APP ATM 4.3.2	Analyse effect of coordination requested by an adjacent position/unit.	4	*Optional content: delegation/transfer of responsibility for air–ground communications and separation, release point, transfer of control, etc.*	ALL
APP ATM 4.3.3	Select, after negotiation, an appropriate course of action.	5		ALL
APP ATM 4.3.4	Ensure the agreed course of action is carried out.	4		ALL
APP ATM 4.3.5	Coordinate when providing FIS.	4	ICAO Doc 4444	ALL
APP ATM 4.3.6	Coordinate when providing ALRS.	4	ICAO Doc 4444	ALL

TOPIC ATM 5 — ALTIMETRY AND LEVEL ALLOCATION				
Subtopic ATM 5.1 — Altimetry				
APP ATM 5.1.1	Allocate levels according to altimetry data.	4		ALL
APP ATM 5.1.2	Ensure separation according to altimetry data.	4	*Optional content: transition level, transition altitude, transition layer, height, flight level, altitude, vertical distance to airspace boundaries*	ALL
Subtopic ATM 5.2 — Terrain clearance				
APP ATM 5.2.1	Provide planning, coordination and control actions appropriate to the rules for minimum safe levels and terrain clearance.	4	*Optional content: terrain clearance dimensions, minimum safe altitudes, transition level, minimum flight level, minimum sector altitude*	APP ACP

TOPIC ATM 6 — SEPARATIONS				
Subtopic ATM 6.1 — Vertical separation				
APP ATM 6.1.1	Provide standard vertical separation.	4	ICAO Doc 4444, level allocation, during climb/descent, rate of climb/descent, holding pattern	APP APS
APP ATM 6.1.2	Provide increased vertical separation.	4	ICAO Doc 4444, *Optional content: level allocation, during climb/descent, rate of climb/descent, degraded aircraft performance, non-RVSM aircraft, reported severe turbulence*	APP ACP APS ACS
APP ATM 6.1.3	Appreciate the application of emergency vertical separation.	3	ICAO Doc 4444, ICAO Doc 7030	APP ACP APS ACS
Subtopic ATM 6.2 — Horizontal separation				
APP ATM 6.2.1	Provide longitudinal separation.	4	Based on time, based on distance (DME and/or GNSS, RNAV)	APP
APP ATM 6.2.2	Provide lateral separation.	4	ICAO Doc 4444, ICAO Doc 7030, holding	APP ACP
APP ATM 6.2.3	Provide track separation.	4		ACP APP
APP ATM 6.2.4	Provide geographical separation.	4	Visual, using navigation aids, area navigation	ACP APP
Subtopic ATM 6.3 — Delegation of separation				
APP ATM 6.3.1	Delegate separation to pilots in the case of aircraft executing successive visual approaches.	4		APP APS
APP ATM 6.3.2	Appreciate the conditions which must be met when delegating separation to pilots to fly maintaining own separation while in VMC.	3	ICAO Doc 4444	APP APS

TOPIC ATM 7 — AIRBORNE COLLISION AVOIDANCE SYSTEMS AND GROUND-BASED SAFETY NETS				
Subtopic ATM 7.1 — Airborne collision avoidance systems				
APP ATM 7.1.1	Differentiate between ACAS advisory thresholds and separation standards applicable in the approach control environment.	2	ICAO Doc 9863 *Optional content: EUROCONTROL TCAS web page*	APP APS
APP ATM 7.1.2	Describe the controller responsibility during and following an ACAS RA reported by pilot.	2	ICAO Doc 4444	ALL
APP ATM 7.1.3	Respond to pilot notification of actions based on airborne systems warnings.	3	ACAS, TAWS	ALL

TOPIC ATM 8 — DATA DISPLAY				
Subtopic ATM 8.1 — Data management				
APP ATM 8.1.1	Update the data display to accurately reflect the traffic situation.	3	*Optional content: information displayed, strip-marking procedures, electronic information data displays, actions based on traffic display information, calculation of EETs*	ALL
APP ATM 8.1.2	Analyse pertinent data on data displays.	4		ALL
APP ATM 8.1.3	Organise pertinent data on data displays.	4		ALL
APP ATM 8.1.4	Obtain flight plan information.	3	CPL, FPL, supplementary information *Optional content: RPL, AFIL, etc.*	ALL
APP ATM 8.1.5	Use flight plan information.	3		ALL

TOPIC ATM 9 — OPERATIONAL ENVIRONMENT (SIMULATED)				
Subtopic ATM 9.1 — Integrity of the operational environment				
APP ATM 9.1.1	Obtain information concerning the operational environment.	3	*Optional content: briefing, notices, local orders, verification of information*	ALL
APP ATM 9.1.2	Ensure the integrity of the operational environment.	4	*Optional content: integrity of displays, verification of the information provided by displays, etc.*	APP ACP APS ACS
Subtopic ATM 9.2 — Verification of the currency of operational procedures				
APP ATM 9.2.1	Check all relevant documentation before managing traffic.	3	*Optional content: briefing, letters of agreement (LoAs), NOTAMs, AICs*	ALL
APP ATM 9.2.2	Manage traffic in accordance with a change to operational procedures.	4		APP ACP APS ACS
Subtopic ATM 9.3 — Handover–takeover				
APP ATM 9.3.1	Transfer information to the relieving controller.	3		ALL
APP ATM 9.3.2	Obtain information from the controller handing over.	3		ALL

TOPIC ATM 10 — PROVISION OF CONTROL SERVICE				
Subtopic ATM 10.1 — Responsibility and processing of information				
APP ATM 10.1.1	Describe the division of responsibility among air traffic control units.	2	ICAO Doc 4444	*ALL*
APP ATM 10.1.2	Describe the responsibility in regard to military traffic.	2	ICAO Doc 4444 *Optional content: ICAO Doc 9554*	*ALL*
APP ATM 10.1.3	Describe the responsibility in regard to unmanned free balloons.	2		APP ACP APS ACS
APP ATM 10.1.4	Obtain operational information.	3	ICAO Doc 4444, local operation manuals	APP ACP APS ACS
APP ATM 10.1.5	Interpret operational information.	5		APP ACP APS ACS
APP ATM 10.1.6	Organise forwarding of operational information.	4	*Optional content: including the use of backup procedures*	APP ACP APS ACS
APP ATM 10.1.7	Integrate operational information into control decisions.	4		APP ACP APS ACS
APP ATM 10.1.8	Appreciate the influence of operational requirements.	3	*Optional content: military flying, calibration flights, aerial photography*	*ALL*
Subtopic ATM 10.2 — Approach control				
APP ATM 10.2.1	Explain the responsibility for the provision of an approach procedural control service.	2	ICAO Doc 4444, ICAO Annex 11, local operation manuals	APP
APP ATM 10.2.2	Provide planning, coordination and control actions appropriate to VFR, SVFR and IFR traffic in VMC and IMC.	4	ICAO Annex 11, ICAO Doc 4444	APP *ACP* *APS* *ACS*
Subtopic ATM 10.3 — Traffic management process				
APP ATM 10.3.1	Ensure that situational awareness is maintained.	4	Information gathering, traffic projection	APP ACP
APP ATM 10.3.2	Detect conflicts in time for appropriate resolution.	4		ALL
APP ATM 10.3.3	Identify potential solutions to achieve a safe and effective traffic flow.	3		APP ACP APS ACS

APP ATM 10.3.4	Evaluate possible outcomes of different planning and control actions.	5		APP ACP APS ACS
APP ATM 10.3.5	Select an appropriate plan in time to achieve safe and effective traffic flow.	5		APP ACP APS ACS
APP ATM 10.3.6	Ensure an adequate priority of actions.	4		ALL
APP ATM 10.3.7	Execute selected plan in a timely manner.	3		APP ACP APS ACS
APP ATM 10.3.8	Ensure a safe and efficient outcome is achieved.	4	Traffic monitoring, adaptability and follow-up	ALL
Subtopic ATM 10.4 — Handling traffic				
APP ATM 10.4.1	Manage arrivals, departures and overflights.	4		APP ACP APS ACS
APP ATM 10.4.2	Balance the workload against personal capacity.	5	*Optional content: rerouting, replanning, prioritising solutions, denying requests, delegating responsibility for separation*	APP ACP APS ACS
APP ATM 10.4.3	Manage traffic on different types of approaches.	4	Precision, non-precision, visual	APP *APS*
APP ATM 10.4.4	Initiate missed approach.	3	ICAO Doc 4444, *Optional content: https://www.skybrary.aero*	APP *APS*
APP ATM 10.4.5	Integrate aircraft on missed approach into the traffic situation.	4		APP *APS*

TOPIC ATM 11 — HOLDING				
Subtopic ATM 11.1 — General holding procedures				
APP ATM 11.1.1	Apply holding procedures.	3	ICAO Doc 4444, holding instructions, allocation of holding levels, onward clearance times	APP ACP APS ACS
APP ATM 11.1.2	Appreciate the factors affecting holding patterns.	3	Effect of speed, effect of level used, effect of navigation aid in use, turbulence, aircraft type	APP ACP APS ACS
Subtopic ATM 11.2 — Approaching aircraft				
APP ATM 11.2.1	Issue Expected Approach Times (EATs).	3		APP APS
APP ATM 11.2.2	Organise the traffic landing sequence in a holding pattern.	4	*Optional content: company preference, aircraft performance, aircraft approach capability, ILS categories, flow control management*	APP APS

SUBJECT 4: METEOROLOGY

The subject objective is:

Learners shall acquire, decode and make proper use of meteorological information relevant to the provision of ATS.

TOPIC MET 1 — METEOROLOGICAL PHENOMENA				
Subtopic MET 1.1 — Meteorological phenomena				
APP MET 1.1.1	Appreciate the impact of adverse weather on aircraft.	3	Thunderstorms, icing, clear-air turbulence (CAT), turbulence, microburst, wind shear, severe mountain waves, squall lines, volcanic ash	APP APS
APP MET 1.1.2	Integrate data about meteorological phenomena into the provision of ATS.	4	Clearances, instructions and transmitted information *Optional content: relevant meteorological phenomena*	*ALL*
APP MET 1.1.3	Use techniques to avoid adverse weather when necessary/possible.	3	Rerouting, level change, etc.	APP ACP APS ACS

TOPIC MET 2 — SOURCES OF METEOROLOGICAL DATA				
Subtopic MET 2.1 — Sources of meteorological information				
APP MET 2.1.1	Obtain meteorological information.	3	METAR, TAF, SIGMET, AIRMET *Optional content: AIREP/special AIREP*	APP ACP APS ACS
APP MET 2.1.2	Relay meteorological information.	3	ICAO Doc 4444, *Optional content: flight information centre, adjacent ATS unit*	*ALL*

SUBJECT 5: NAVIGATION

The subject objective is:

Learners shall analyse all navigational aspects in order to organise the traffic.

TOPIC NAV 1 — MAPS AND AERONAUTICAL CHARTS				
Subtopic NAV 1.1 — Maps and charts				
APP NAV 1.1.1	Decode symbols and information displayed on aeronautical maps and charts.	3	Instrument approach charts, SID & STAR charts, aerodrome charts *Optional content: visual approach charts, military maps and charts*	ADI APP APS
APP NAV 1.1.2	Use relevant maps and charts.	3		APP *ACP* APS *ACS*

TOPIC NAV 2 — INSTRUMENT NAVIGATION				
Subtopic NAV 2.1 — Navigational systems				
APP NAV 2.1.1	Manage traffic in case of change in the operational status of navigational systems.	4	*Optional content: limitations, availability and status of ground-based and satellite-based systems*	APP ACP APS ACS
APP NAV 2.1.2	Appreciate the effect of a change in the operational status of navigational systems.	3	*Optional content: precision, limitations, status, degraded procedures*	*ALL*
Subtopic NAV 2.2 — Stabilised approach				
APP NAV 2.2.1	Describe the concept of stabilised approach.	2	*Optional content: https://www.skybrary.aero*	ADV ADI APP APS
APP NAV 2.2.2	Appreciate the effect of late change of runway-in-use or type of approach for landing aircraft.	3	Cockpit workload *Optional content: impact on vertical profile (CDO), FMS management, crew procedure briefing, missed approach, loss of situational awareness, etc.*	APP APS
APP NAV 2.2.3	Appreciate controller actions that may contribute to unstabilised approach.	3	Delayed descent	APP
Subtopic NAV 2.3 — Instrument departures and arrivals				
APP NAV 2.3.1	Describe relevant SIDs and STARs.	2		ADI APP APS
APP NAV 2.3.2	Describe the types and phases of instrument approach procedures.	2		APP APS
APP NAV 2.3.3	Describe the relevant minima applicable for a precision/non-precision and visual approach.	2	*Optional content: Type A/B operations, CAT I/II/III criteria, LNAV, LNAV/VNAV, LPV, RNP AR APCH minima*	ADI APP APS

Subtopic NAV 2.4 — Navigational assistance				
APP NAV 2.4.1	Evaluate the necessary information to be provided to pilots in need of navigational assistance.	5	*Optional content: nearest most suitable aerodrome, track, heading, distance, aerodrome information, any other navigational assistance relevant at the time*	APP ACP APS ACS
Subtopic NAV 2.5 — Satellite-based systems				
APP NAV 2.5.1	State the different applications of satellite-based systems relevant for approach operations.	1	RNP APCH, RNP AR APCH, SBAS, GBAS *Optional content: LNAV, LNAV/VNAV, LPV, RNP minima, precision approach*	APP APS
Subtopic NAV 2.6 — PBN applications				
APP NAV 2.6.1	State the navigation applications used in approach and terminal environments.	1	Approach-RNP APCH/ RNP AR APCH, Terminal-RNAV-1 RNP 1 with RF, rotorcraft option RNP 0.3 *Optional content: ICAO Doc 9613.*	APP APS
APP NAV 2.6.2	Explain the principles and designation of navigation specifications in use.	2	Performance, functionality, sensors *Optional content: aircrew and controller requirements, accuracy requirements, integrity and continuity*	APP ACP APS ACS
APP NAV 2.6.3	State future PBN developments.	1	A-RNP, RNP (AR) DEP *Optional content: RNP 3D, VNAV, 4D, TBO*	ADI APP ACP APS ACS

SUBJECT 6: AIRCRAFT

The subject objective is:

Learners shall assess and integrate aircraft performance in the provision of ATS.

TOPIC ACFT 1 — AIRCRAFT INSTRUMENTS				
Subtopic ACFT 1.1 — Aircraft instruments				
APP ACFT 1.1.1	Integrate information from aircraft instruments provided by the pilot in the provision of ATS.	4		ALL
APP ACFT 1.1.2	Explain the operation of aircraft radio equipment.	2	*Optional content: radios (number of), emergency radios*	ALL

TOPIC ACFT 2 — AIRCRAFT CATEGORIES				
Subtopic ACFT 2.1 — Wake turbulence				
APP ACFT 2.1.1	Explain the wake turbulence effect and associated hazards to succeeding aircraft.	2		ALL
APP ACFT 2.1.2	Appreciate the techniques used to prevent hazards associated with wake turbulence to succeeding aircraft.	3		ALL
Subtopic ACFT 2.2 — Application of ICAO approach categories				
APP ACFT 2.2.1	Describe the use of ICAO approach categories.	2	ICAO Doc 8168	ADI APP APS
APP ACFT 2.2.2	Appreciate the effect of ICAO approach categories on the organisation of traffic.	3		ADI APP APS

TOPIC ACFT 3 — FACTORS AFFECTING AIRCRAFT PERFORMANCE				
Subtopic ACFT 3.1 — Climb factors				
APP ACFT 3.1.1	Integrate the influence of factors affecting aircraft during climb.	4	*Optional content: speed, mass, air density, cabin pressurisation, wind and temperature*	APP ACP APS ACS
APP ACFT 3.1.2	Describe the influence of factors affecting departing aircraft.	3	*Optional content: runway conditions, runway slope, aerodrome elevation, wind, temperature, aircraft configuration, airframe contamination and aircraft mass*	APP APS
Subtopic ACFT 3.2 — Cruise factors				
APP ACFT 3.2.1	Integrate the influence of factors affecting aircraft during cruise.	4	*Optional content: level, cruising speed, wind, mass, cabin pressurisation*	APP APS
Subtopic ACFT 3.3 — Descent and initial approach factors				
APP ACFT 3.3.1	Integrate the influence of factors affecting aircraft during descent.	4	*Optional content: wind, speed, rate of descent, aircraft configuration, cabin pressurisation*	APP APS

Subtopic ACFT 3.4 — Final approach and landing factors				
APP ACFT 3.4.1	Integrate the influence of factors affecting aircraft during final approach and landing.	4	*Optional content: wind, aircraft configuration, mass, meteorological conditions, runway conditions, runway slope, aerodrome elevation*	APP APS
Subtopic ACFT 3.5 — Economic factors				
APP ACFT 3.5.1	Integrate consideration of economic factors affecting aircraft.	4	*Optional content: routing, level, speed, rate of climb and rate of descent, approach profile*	APP APS
APP ACFT 3.5.2	Use continuous climb techniques where applicable.	3		APP *ACP*
APP ACFT 3.5.3	Use direct routing where applicable.	3		APP *ACP* APS *ACS*
Subtopic ACFT 3.6 — Environmental factors				
APP ACFT 3.6.1	Appreciate the performance restrictions due to environmental considerations.	3	*Optional content: fuel-dumping, noise-abatement procedures, minimum flight levels, bird strike hazard, continuous descent operations*	APP APS
TOPIC ACFT 4 — AIRCRAFT DATA				
Subtopic ACFT 4.1 — Performance data				
APP ACFT 4.1.1	Integrate the average performance data of a representative sample of aircraft which will be encountered in the operational/ working environment into the provision of control service.	4	Performance data under a representative variety of circumstances	APP ACP APS ACS

SUBJECT 7: HUMAN FACTORS

The subject objective is:

Learners shall recognise the necessity to constantly extend their knowledge and analyse factors which affect personal and team performance.

TOPIC HUM 1 — PSYCHOLOGICAL FACTORS				
Subtopic HUM 1.1 — Cognitive				
APP HUM 1.1.1	Describe the human information-processing model.	2	Attention, perception, memory, situational awareness, decision-making, response	ALL
APP HUM 1.1.2	Describe the factors which influence human information-processing.	2	Confidence, stress, learning, knowledge, experience, fatigue, alcohol/drugs, distraction, interpersonal relations	ALL
APP HUM 1.1.3	Monitor the effect of human information-processing factors on decision-making.	3	*Optional content: workload, stress, interpersonal relations, distraction, confidence*	ALL

TOPIC HUM 2 — MEDICAL AND PHYSIOLOGICAL FACTORS				
Subtopic HUM 2.1 — Fatigue				
APP HUM 2.1.1	State factors that cause fatigue.	1	Shift work *Optional content: night shifts and rosters, ICAO/IFATCA/CANSO's Fatigue Management Guide for Air Traffic Service Providers*	ALL
APP HUM 2.1.2	Describe the onset of fatigue.	2	*Optional content: lack of concentration, listlessness, irritability, frustration, ICAO/IFATCA/CANSO's Fatigue Management Guide for Air Traffic Service Providers*	ALL
APP HUM 2.1.3	Recognise the onset of fatigue in self.	1	*Optional content: ICAO/IFATCA/CANSO's Fatigue Management Guide for Air Traffic Service Providers*	ALL
APP HUM 2.1.4	Recognise the onset of fatigue in others.	1		ALL
APP HUM 2.1.5	Describe appropriate action when recognising fatigue.	2		ALL
Subtopic HUM 2.2 — Fitness				
APP HUM 2.2.1	Recognise signs of lack of personal fitness.	1		ALL
APP HUM 2.2.2	Describe actions when aware of a lack of personal fitness.	2		ALL

TOPIC HUM 3 — SOCIAL AND ORGANISATIONAL FACTORS				
Subtopic HUM 3.1 — Team resource management (TRM)				
APP HUM 3.1.1	State the relevance of TRM.	1	*Optional content: TRM course, EUROCONTROL Guidelines for the development of TRM training*	ALL
APP HUM 3.1.2	State the content of the TRM concept.	1	*Optional content: teamwork, human error, team roles, stress, decision-making, communication, situational awareness*	ALL
Subtopic HUM 3.2 — Teamwork and team roles				
APP HUM 3.2.1	Identify reasons for conflict.	3		ALL
APP HUM 3.2.2	Describe actions to prevent human conflicts.	2	*Optional content: TRM team roles*	ALL
APP HUM 3.2.3	Describe strategies to cope with human conflicts.	2	*Optional content: in your team, in the simulator*	ALL
Subtopic HUM 3.3 — Responsible behaviour				
APP HUM 3.3.1	Consider the factors which influence responsible behaviour.	2	*Optional content: situation, team, personal situation and judgement, instance of justification, moral motivation, personality*	ALL
APP HUM 3.3.2	Apply responsible judgement.	3	Case study and discussion about a dilemma situation	ALL

TOPIC HUM 4 — STRESS				
Subtopic HUM 4.1 — Stress				
APP HUM 4.1.1	Recognise the effects of stress on performance.	1	Stress and its symptoms in self and in others	ALL
Subtopic HUM 4.2 — Stress management				
APP HUM 4.2.1	Act to reduce stress.	3	The effect of personality in coping with stress, the benefits of active stress management	ALL
APP HUM 4.2.2	Respond to stressful situations by offering, asking or accepting assistance.	3	*Optional content: the benefits of offering, accepting and asking for help in stressful situations*	ALL
APP HUM 4.2.3	Recognise the effect of shocking and stressful events.	1	Self and others, abnormal situations, Critical Incident Stress Management (CISM)	ALL
APP HUM 4.2.4	Consider the benefits of Critical Incident Stress Management (CISM).	2		ALL
APP HUM 4.2.5	Explain procedures to be used following an incident/accident.	2	*Optional content: CISM, counselling, human element*	ALL

TOPIC HUM 5 — HUMAN ERROR				
Subtopic HUM 5.1 — Human error				
APP HUM 5.1.1	Explain the relationship between error and safety.	2	Number and combination of errors, proactive versus reactive approach to discovery of error *Optional content: ICAO Circular 314 — AN/178 Threat and Error Management (TEM) in Air Traffic Control*	ALL
APP HUM 5.1.2	Differentiate between the types of error.	2	Slips, lapses, mistakes *Optional content: ICAO Circular 314 — AN/178 Threat and Error Management (TEM) in Air Traffic Control*	ALL
APP HUM 5.1.3	Describe error-prone conditions.	2	*Optional content: increase in traffic, changes in procedures, complexities of systems or traffic, weather, unusual occurrences*	ALL
APP HUM 5.1.4	Collect examples of different error types, their causes and consequences for ATC.	3	*Optional content: ICAO Circular 314 — AN/178 Threat and Error Management (TEM) in Air Traffic Control*	ALL
APP HUM 5.1.5	Explain how to detect errors to compensate for them.	2	STCA, MSAW, individual and collective strategy *Optional content: ICAO Circular 314 — AN/178 Threat and Error Management (TEM) in Air Traffic Control*	ALL
APP HUM 5.1.6	Execute corrective actions.	3	Error compensation *Optional content: ICAO Circular 314 — AN/178 Threat and Error Management (TEM) in Air Traffic Control*	ALL
APP HUM 5.1.7	Explain the importance of error management.	2	*Optional content: prevention of incidents, safety improvement, revision of procedures and/or working practices*	ALL
APP HUM 5.1.8	Describe the impact on an ATCO's performance following an occurrence/incident.	2	*Optional content: reporting, SMS, investigation, CISM*	ALL
Subtopic HUM 5.2 — Violation of rules				
APP HUM 5.2.1	Explain the causes and dangers of violation of rules becoming accepted as a practice.	2	*Optional content: ICAO Circular 314 — AN/178 Threat and Error Management (TEM) in Air Traffic Control*	ALL

TOPIC HUM 6 — COLLABORATIVE WORK				
Subtopic HUM 6.1 — Communication				
APP HUM 6.1.1	Use communication effectively in ATC.	3		ALL
APP HUM 6.1.2	Analyse examples of pilot–controller communication for effectiveness.	4		ALL

Subtopic HUM 6.2 — Collaborative work within the same area of responsibility				
APP HUM 6.2.1	List communication means between controllers in charge of the same area of responsibility (sector or tower).	1	*Optional content: electronic, written, verbal and non-verbal communication*	ALL
APP HUM 6.2.2	Explain consequences of the use of communication means on effectiveness.	2	*Optional content: strip legibility and encoding, label designation, feedback*	ALL
APP HUM 6.2.3	List possible actions to provide a safe position handover.	1	*Optional content: rigour, preparation, overlap time*	ALL
APP HUM 6.2.4	Explain consequences of a missed position handover process.	2		ALL
Subtopic HUM 6.3 — Collaborative work between different areas of responsibility				
APP HUM 6.3.1	List factors and means for an effective coordination between sectors and/or tower positions.	1	*Optional content: other sectors' constraints, electronic coordination tools*	ALL
Subtopic HUM 6.4 — Controller–pilot cooperation				
APP HUM 6.4.1	Describe parameters affecting controller–pilot cooperation.	2	*Optional content: workload, mutual knowledge, controller versus pilot mental picture*	ALL

SUBJECT 8: EQUIPMENT AND SYSTEMS

The subject objective is:

Learners shall integrate knowledge and understanding of the basic working principles of equipment and systems, and comply with the equipment and system degradation procedures in the provision of ATS.

TOPIC EQPS 1 — VOICE COMMUNICATIONS				
Subtopic EQPS 1.1 — Radio communications				
APP EQPS 1.1.1	Operate two-way communication equipment.	3	Transmit/receive switches, procedures *Optional content: frequency selection, standby equipment*	ALL
APP EQPS 1.1.2	Identify indications of operational status of radio equipment.	3	*Optional content: indicator lights, serviceability displays, selector/frequency displays*	ALL
APP EQPS 1.1.3	Consider radio range.	2	*Optional content: transfer to another frequency, apparent radio failure, failure to establish radio contact, frequency protection range*	APP ACP APS ACS
Subtopic EQPS 1.2 — Other voice communications				
APP EQPS 1.2.1	Operate landline communications.	3	*Optional content: telephone, interphone and intercom equipment*	ALL

TOPIC EQPS 2 — AUTOMATION IN ATS				
Subtopic EQPS 2.1 — Aeronautical fixed telecommunication network (AFTN)				
APP EQPS 2.1.1	Decode AFTN messages.	3	*Optional content: movement and control messages, NOTAM, SNOWTAM, BIRDTAM, etc.*	ALL
Subtopic EQPS 2.2 — Automatic data interchange				
APP EQPS 2.2.1	Use automatic data transfer equipment where available.	3	*Optional content: automated information and coordination, OLDI*	APP ACP

TOPIC EQPS 3 — CONTROLLER WORKING POSITION				
Subtopic EQPS 3.1 — Operation and monitoring of equipment				
APP EQPS 3.1.1	Monitor the technical integrity of the controller working position.	3	Notification procedures, responsibilities	ALL
APP EQPS 3.1.2	Operate the equipment of the controller working position.	3	*Optional content: situation displays, flight progress board, flight data display, radio, telephone, maps and charts, strip-printer, clock, information systems, UDF/VDF*	ALL
APP EQPS 3.1.3	Operate available equipment in abnormal and emergency situations.	3		ALL
Subtopic EQPS 3.2 — Situation displays and information systems				
APP EQPS 3.2.1	Use situation displays.	3		ALL

APP EQPS 3.2.2	Check availability of information.	3		ALL
APP EQPS 3.2.3	Obtain information from equipment.	3		APP ACP APS ACS
Subtopic EQPS 3.3 — Flight data systems				
APP EQPS 3.3.1	Use the flight data information at controller working position.	3		ALL
TOPIC EQPS 4 — FUTURE EQUIPMENT				
Subtopic EQPS 4.1 — New developments				
APP EQPS 4.1.1	Recognise future developments.	1	New advanced systems	ALL
TOPIC EQPS 5 — EQUIPMENT AND SYSTEMS' LIMITATIONS AND DEGRADATION				
Subtopic EQPS 5.1 — Reaction to limitations				
APP EQPS 5.1.1	Take account of the limitations of equipment and systems.	2		ALL
APP EQPS 5.1.2	Respond to technical deficiencies of the operational position.	3	Notification procedures, responsibilities	ALL
Subtopic EQPS 5.2 — Communication equipment degradation				
APP EQPS 5.2.1	Identify that communication equipment has degraded.	3	*Optional content: ground–air and landline communications*	APP ACP APS ACS
APP EQPS 5.2.2	Apply contingency procedures in the event of communication equipment degradation.	3	*Optional content: procedures for total or partial degradation of ground–air and landline communications, alternative methods of transferring data*	APP ACP APS ACS
Subtopic EQPS 5.3 — Navigational equipment degradation				
APP EQPS 5.3.1	Identify when a navigational equipment failure will affect operational ability.	3	*Optional content: VOR, navigational aids*	ALL
APP EQPS 5.3.2	Apply contingency procedures in the event of a navigational equipment degradation.	3	*Optional content: vertical separation, information to aircraft, navigational assistance, seeking assistance from adjacent units*	ADI APP ACP APS ACS

SUBJECT 9: PROFESSIONAL ENVIRONMENT

The subject objective is:

Learners shall identify the need for close cooperation with other parties concerning ATM operations and appreciate aspects of environmental protection.

TOPIC PEN 1 — FAMILIARISATION				
Subtopic PEN 1.1 — Study visit to approach control unit				
APP PEN 1.1.1	Appreciate the functions and provision of operational approach control service.	3	Study visit to an approach control unit	APP APS

TOPIC PEN 2 — AIRSPACE USERS				
Subtopic PEN 2.1 — Contributors to civil ATS operations				
APP PEN 2.1.1	Characterise civil ATS activities in approach control unit.	2	Study visit to an approach control unit *Optional content: familiarisation visits to TWR, ACC, AIS, RCC*	APP APS
APP PEN 2.1.2	Characterise other parties interfacing with ATS operations.	2	*Optional content: familiarisation visits to engineering services, firefighting and emergency services, airline operations offices*	ALL
Subtopic PEN 2.2 — Contributors to military ATS operations				
APP PEN 2.2.1	Characterise military ATS activities.	2	*Optional content: familiarisation visits to TWR, APP, ACC, AIS, RCC, Air Defence Units*	ALL

TOPIC PEN 3 — CUSTOMER RELATIONS				
Subtopic PEN 3.1 — Provision of services and user requirements				
APP PEN 3.1.1	Identify the role of ATC as a service provider.	3		ALL
APP PEN 3.1.2	Appreciate ATS users' requirements.	3		ALL

TOPIC PEN 4 — ENVIRONMENTAL PROTECTION				
Subtopic PEN 4.1 — Environmental protection				
APP PEN 4.1.1	Describe the environmental constraints on aerodrome operations.	2	*Optional content: ICAO Circular 303 — Operational opportunities to minimise fuel use and reduce emissions*	ADV ADI APP APS
APP PEN 4.1.2	Explain the use of Collaborative Environmental Management (CEM) process at aerodromes.	2		ADV ADI APP APS
APP PEN 4.1.3	Appreciate the mitigation techniques used to minimise aviation's impact on the environment.	3	*Optional content: noise-abatement procedures, noise preferential routes, flight efficiency*	APP APS

SUBJECT 10: ABNORMAL AND EMERGENCY SITUATIONS

The subject objective is:

Learners shall develop a professional attitude to manage traffic in abnormal and emergency situations.

TOPIC ABES 1 — ABNORMAL AND EMERGENCY SITUATIONS (ABES)				
Subtopic ABES 1.1 — Overview of ABES				
APP ABES 1.1.1	List common abnormal and emergency situations.	1	*Optional content: EATM Guidelines for Controller Training in the Handling of Unusual/Emergency Situations, ambulance flights, ground-based safety nets alerts, airframe failure, unreliable instruments, runway incursion*	ALL
APP ABES 1.1.2	Identify potential or actual abnormal and emergency situations.	3		ALL
APP ABES 1.1.3	Take into account the procedures for given abnormal and emergency situations.	2	*Optional content: ICAO Doc 4444*	APP ACP APS ACS
APP ABES 1.1.4	Take into account that procedures do not exist for all abnormal and emergency situations.	2	*Optional content: real-life examples*	ALL
APP ABES 1.1.5	Consider how the evolution of a situation may have an impact on safety.	2	*Optional content: separation, information, coordination*	ALL

TOPIC ABES 2 — SKILLS IMPROVEMENT				
Subtopic ABES 2.1 — Communication effectiveness				
APP ABES 2.1.1	Ensure effective communication in all circumstances including the case where standard phraseology is not applicable.	4	Phraseology, vocabulary, readback, radio silence instruction	ALL
Subtopic ABES 2.2 — Avoidance of mental overload				
APP ABES 2.2.1	Describe actions to keep the situation under control.	2	*Optional content: sector-splitting, holding, flow management, task delegation*	ALL
APP ABES 2.2.2	Organise priority of actions.	4		ALL
APP ABES 2.2.3	Ensure effective dissemination of information.	4	*Optional content: between executive and planner/coordinator, with the supervisor, between sectors, between ACC, APP and TWR, with ground staff, etc.*	ALL
APP ABES 2.2.4	Consider asking for help.	2		ALL

Subtopic ABES 2.3 — Air–ground cooperation				
APP ABES 2.3.1	Collect appropriate information relevant to the situation.	3		ALL
APP ABES 2.3.2	Assist the pilot.	3	Pilot workload *Optional content: instructions, information, support, human factors, etc.*	ALL
TOPIC ABES 3 — PROCEDURES FOR ABNORMAL AND EMERGENCY SITUATIONS (ABES)				
Subtopic ABES 3.1 — Application of procedures for ABES				
APP ABES 3.1.1	Apply the procedures for given abnormal and emergency situations.	3	*Optional content: EATM Guidelines for Controller Training in the Handling of Unusual/Emergency Situations, ambulance flights, ground-based safety nets alerts, airframe failure*	ALL
Subtopic ABES 3.2 — Radio failure				
APP ABES 3.2.1	Describe the procedures to be followed by a pilot when that pilot experiences complete or partial radio failure.	2	*Optional content: ICAO Doc 4444, military procedures*	ALL
APP ABES 3.2.2	Apply the procedures to be followed when a pilot experiences complete or partial radio failure.	3	*Optional content: prolonged loss of communication*	ALL
Subtopic ABES 3.3 — Unlawful interference and aircraft bomb threat				
APP ABES 3.3.1	Apply ATC procedures associated with unlawful interference and aircraft bomb threat.	3		ALL
Subtopic ABES 3.4 — Strayed or unidentified aircraft				
APP ABES 3.4.1	Apply the procedures in the case of strayed aircraft.	3	*Optional content: inside controlled airspace, outside controlled airspace*	ALL
APP ABES 3.4.2	Apply the procedures in the case of unidentified aircraft.	3		ALL
Subtopic ABES 3.5 — Diversions				
APP ABES 3.5.1	Provide navigational assistance to aircraft diverting in emergency.	4	Track/heading, distance, other navigational assistance *Optional content: nearest most suitable aerodrome*	APP ACP APS ACS

SUBJECT 11: AERODROMES

The subject objective is:

Learners shall recognise and understand the design and layout of aerodromes.

TOPIC AGA 1 — AERODROME DATA, LAYOUT AND COORDINATION				
Subtopic AGA 1.1 — Definitions				
APP AGA 1.1.1	Define aerodrome data.	1	*Optional content: aerodrome elevation, reference point, apron, movement area, manoeuvring area, hot spot*	ADV ADI APP APS
Subtopic AGA 1.2 — Coordination				
APP AGA 1.2.1	Identify the information that has to be exchanged between Air Traffic Services (ATS) and the aerodrome authority.	3	Aerodrome conditions, fire/rescue category, condition of ground equipment and NAVAIDs, AIRAC	APP APS ADV ADI

TOPIC AGA 2 — MOVEMENT AREA				
Subtopic AGA 2.1 — Movement area				
APP AGA 2.1.1	Describe movement area.	2		ADV ADI APP APS
APP AGA 2.1.2	Describe the marking of obstacles and unusable or unserviceable areas.	2	Flags, signs on pavement, lights	ADV ADI APP APS
APP AGA 2.1.3	Identify the information on conditions of the movement area that has to be passed on to aircraft.	3	Essential information on aerodrome conditions	ADV ADI APP APS
Subtopic AGA 2.2 — Manoeuvring area				
APP AGA 2.2.1	Describe manoeuvring area.	2		ADV ADI APP APS
APP AGA 2.2.2	Describe taxiway.	2		ADV ADI APP APS
APP AGA 2.2.3	Describe daylight marking on taxiways.	2		ADV ADI APP APS
APP AGA 2.2.4	Describe taxiway lighting.	2		ADV ADI APP APS

Subtopic AGA 2.3 — Runways				
APP AGA 2.3.1	Describe runway.	2	Runway, runway surface, runway strip, shoulder, runway-end safety areas, clearways, stopways	ADV ADI APP APS
APP AGA 2.3.2	Describe instrument runway.	2		ADI APP APS
APP AGA 2.3.3	Describe non-instrument runway.	2		*ADV* ADI APP APS
APP AGA 2.3.4	Explain declared distances.	2	TORA, TODA, ASDA, LDA	*ADV* ADI APP APS
APP AGA 2.3.5	Explain the differences between ACN and PCN.	2	Strength of pavements	*ADV* ADI APP APS
APP AGA 2.3.6	Describe the daylight markings on runways.	2	*Optional content: runway designator, centre line, threshold, aiming point, fixed distance, touchdown zone, side strip, colour*	*ADV* ADI APP APS
APP AGA 2.3.7	Describe runway lights.	2	*Optional content: colour, centre line, intensity, edge, touchdown zone, threshold, barettes*	*ADV* ADI APP APS
APP AGA 2.3.8	Explain the functions of visual landing aids.	2	*Optional content: AVASI, VASI, PAPI*	*ADV* ADI APP APS
APP AGA 2.3.9	Describe the approach lighting systems.	2	Centre line, cross bars, stroboscopic lights, colours, intensity and brightness	*ADV* ADI APP APS
APP AGA 2.3.10	Characterise the effect of water/ice on runways.	2		*ADV* ADI APP APS
APP AGA 2.3.11	Explain braking action.	2	Braking action coefficient	*ADV* ADI APP APS
APP AGA 2.3.12	Explain the effect of runway visual range on aerodrome operation.	2		*ADV* ADI APP APS

TOPIC AGA 3 — OBSTACLES				
Subtopic AGA 3.1 — Obstacle-free airspace around aerodromes				
APP AGA 3.1.1	Explain the necessity for establishing and maintaining an obstacle-free airspace around aerodromes.	2		ADV ADI APP APS

TOPIC AGA 4 — MISCELLANEOUS EQUIPMENT				
Subtopic AGA 4.1 — Location				
APP AGA 4.1.1	Explain the location of different aerodrome ground equipment.	2	*Optional content: LOC, GP, VDF, radio communication or ATS surveillance systems sensors, stopbars, AVASI, VASI, PAPI*	ADV ADI APP APS

AMC1 ATCO.D.010(a)(2)(iv) Composition of initial training

AREA CONTROL PROCEDURAL RATING (ACP) TRAINING — SUBJECT OBJECTIVES AND TRAINING OBJECTIVES

(a) The general principles that apply to this AMC are contained in AMC1 ATCO.D.010(a).

(b) The ATCO Rating training Area Control Procedural Rating (ACP) should contain the following subject objectives and training objectives that are associated with the subjects, topics and subtopics contained in Appendix 6 to TCAR PEL Part ATCO.

(c) Subjects, topics and subtopics from Appendix 6 to TCAR PEL Part ATCO are repeated in this AMC for the convenience of the reader and do not form part of it.

SUBJECT 1: INTRODUCTION TO THE COURSE

The subject objective is:

Learners shall know and understand the training programme that they will follow and learn how to obtain the appropriate information.

TOPIC INTR 1 — COURSE MANAGEMENT				
Subtopic INTR 1.1 — Course introduction				
ACP INTR 1.1.1	Explain the aims and main objectives of the course.	2		ALL
Subtopic INTR 1.2 — Course administration				
ACP INTR 1.2.1	State how the course is administered.	1		ALL
Subtopic INTR 1.3 — Study material and training documentation				
ACP INTR 1.3.1	Use appropriate documents and their sources for course studies.	3	*Optional content: training documentation, library, CBT library, web, learning management server*	ALL
ACP INTR 1.3.2	Integrate appropriate information into course studies.	4	Training documentation *Optional content: supplementary information, library*	ALL

TOPIC INTR 2 — INTRODUCTION TO THE ATC TRAINING COURSE				
Subtopic INTR 2.1 — Course content and organisation				
ACP INTR 2.1.1	State the different training methods used during the course.	1	Theoretical training, practical training, self-study, types of training events	ALL
ACP INTR 2.1.2	State the subjects covered by the course and their purpose.	1		ALL
ACP INTR 2.1.3	Describe the organisation of theoretical training.	2	*Optional content: course programme*	ALL
ACP INTR 2.1.4	Describe the organisation of practical training.	2	*Optional content: PTP, simulation, briefing, debriefing, course programme*	ALL

Subtopic INTR 2.2 — Training ethos				
ACP INTR 2.2.1	Recognise the feedback mechanisms available.	1	Training progress, assessment, briefing, debriefing, learner–instructor feedback, instructor–instructor feedback	ALL
Subtopic INTR 2.3 — Assessment process				
ACP INTR 2.3.1	Describe the assessment process.	2		ALL

SUBJECT 2: AVIATION LAW

The subject objective is:

Learners shall know, understand and apply the Rules of the Air and the Regulations regarding reporting and airspace, and appreciate the Licensing and Competence principles.

TOPIC LAW 1 — ATCO LICENSING/CERTIFICATE OF COMPETENCE				
Subtopic LAW 1.1 — Privileges and conditions				
ACP LAW 1.1.1	Appreciate the conditions which shall be met to issue an Area Control Procedural rating.	3	Relevant national regulation on ATCO Licensing *Optional content: national documents*	ACP
ACP LAW 1.1.2	Explain how to maintain and update professional knowledge and skills to retain competence in the operational environment.	2		ALL
ACP LAW 1.1.3	Explain the conditions for suspension/ revocation of an ATCO licence.	2	Relevant national regulation on ATCO Licensing	ALL

TOPIC LAW 2 — RULES AND REGULATIONS				
Subtopic LAW 2.1 — Reports				
ACP LAW 2.1.1	List the standard forms for reports.	1	Air traffic incident report *Optional content: routine air-reports, breach of regulations, watchbook/logbook, records*	ALL
ACP LAW 2.1.2	Describe the functions of, and processes for, reporting.	2	Reporting culture, air traffic incident report *Optional content: breach of regulations, watchbook/logbook, records, voluntary reporting*	ALL
ACP LAW 2.1.3	Use forms for reporting.	3	air traffic incident reporting form(s) *Optional content: routine air-reports, breach of regulations, watchbook/logbook, records*	ALL
Subtopic LAW 2.2 — Airspace				
ACP LAW 2.2.1	Appreciate airspace classes and structure and their relevance to operation using the Area Control Procedural rating.	3		ACP
ACP LAW 2.2.2	Provide planning, coordination and control actions appropriate to the classification and structure of airspace.	4	*Optional content: international requirements, civil requirements, military requirements, areas of responsibility, sectorisation, national requirements*	ALL
ACP LAW 2.2.3	Appreciate responsibility for terrain clearance.	3		ALL

TOPIC LAW 3 — ATC SAFETY MANAGEMENT				
Subtopic LAW 3.1 — Feedback process				
ACP LAW 3.1.1	State the importance of controller contribution to the feedback process.	1	*Optional content: voluntary reporting*	ALL
ACP LAW 3.1.2	Describe how reported occurrences are analysed.	2	Relevant national regulations *Optional content: local procedures*	ALL
ACP LAW 3.1.3	Name the means used to disseminate recommendations.	1	*Optional content: safety letters, safety boards web pages*	ALL
ACP LAW 3.1.4	Appreciate the 'Just Culture' concept.	3	Benefits, prerequisites, constraints *Optional content:* *https://www.skybrary.aero*	ALL
Subtopic LAW 3.2 — Safety Investigation				
ACP LAW 3.2.1	Describe role and mission of Safety Investigation in the improvement of safety.	2		ALL
ACP LAW 3.2.2	Define working methods of Safety Investigation.	1		ALL

SUBJECT 3: AIR TRAFFIC MANAGEMENT

The subject objective is:

Learners shall manage air traffic to ensure safe, orderly and expeditious services.

TOPIC ATM 1 — PROVISION OF SERVICES				
Subtopic ATM 1.1 — Air traffic control (ATC) service				
ACP ATM 1.1.1	Appreciate own area of responsibility.	3		APP ACP APS ACS
ACP ATM 1.1.2	Provide area control service.	4	ICAO Annex 11, ICAO Doc 7030, ICAO Doc 4444, operation manuals	ACP ACS
Subtopic ATM 1.2 — Flight information service (FIS)				
ACP ATM 1.2.1	Provide FIS.	4	ICAO Doc 4444, *Optional content: national documents*	*ALL*
ACP ATM 1.2.2	Issue appropriate information concerning the position of conflicting traffic.	3	ICAO Doc 4444, traffic information, essential traffic information	APP ACP *APS ACS*
Subtopic ATM 1.3 — Alerting service (ALRS)				
ACP ATM 1.3.1	Provide ALRS.	4	ICAO Doc 4444, *Optional content: national documents*	ALL
ACP ATM 1.3.2	Respond to distress and urgency messages and signals.	3	ICAO Annex 10, ICAO Doc 4444 *Optional content: EUROCONTROL Guidelines for Controller Training in the Handling of Unusual/Emergency Situations*	ALL
Subtopic ATM 1.4 — ATS system capacity and air traffic flow management				
ACP ATM 1.4.1	Appreciate the impact of ATS system capacity and air traffic flow management on the controller.	3	*Optional content: EUROCONTROL ATFCM Users Manual, FABs, FUA, free route airspace, local implementation of ATFCM principles, etc.*	APP ACP APS ACS
ACP ATM 1.4.2	Apply flow management procedures in the provision of ATC.	3	*Optional content: EUROCONTROL ATFCM Users Manual*	APP ACP APS ACS
ACP ATM 1.4.3	Organise traffic flows and patterns to take account of airspace boundaries.	4	*Optional content: civil and military, controlled, uncontrolled, advisory, restricted, danger, prohibited, special rules, sector boundaries, national boundaries, FIR boundaries, delegated airspace, transfer of control, transfer of communications, en-route, off-route*	APP ACP APS ACS
ACP ATM 1.4.4	Organise traffic flows and patterns to take account of areas of responsibility.	4	*Optional content: EUROCONTROL ATFCM Users Manual*	APP ACP APS ACS

ACP ATM 1.4.5	Inform supervisor of local factors affecting ATS system capacity and air traffic flow management.	3	*Optional content: abnormal situations, decrease in sector capacity, limitations on systems and equipment, changes in workload/capacity, unusual meteorological conditions, relevant information like: reported ground-based incidents, forest fire, smoke, oil pollution*	APP ACP APS ACS
Subtopic ATM 1.5 — Airspace management (ASM)				
ACP ATM 1.5.1	Appreciate the impact of ASM on the controller.	3	*Optional content: FABs, EUROCONTROL Specification for the application of FUA, TSAs, CDRs, CBAs, free route airspace*	APP ACP APS ACS
ACP ATM 1.5.2	Organise traffic to take account of ASM.	4	*Optional content: CDR, TSA, TRA, CBA, real-time activation, deactivation or reallocation of airspace*	APP ACP
TOPIC ATM 2 — COMMUNICATION				
Subtopic ATM 2.1 — Effective communication				
ACP ATM 2.1.1	Use approved phraseology.	3	ICAO Doc 4444 and ICAO Doc 9432	ALL
ACP ATM 2.1.2	Ensure effective communication.	4	Communication techniques, readback/verification of readback	ALL
TOPIC ATM 3 — ATC CLEARANCES AND ATC INSTRUCTIONS				
Subtopic ATM 3.1 — ATC clearances				
ACP ATM 3.1.1	Issue appropriate ATC clearances.	3	*Optional content: ICAO Doc 4444, national documents*	ALL
ACP ATM 3.1.2	Integrate appropriate ATC clearances in control service.	4		ALL
ACP ATM 3.1.3	Ensure the agreed course of action is carried out.	4		ALL
Subtopic ATM 3.2 — ATC instructions				
ACP ATM 3.2.1	Issue appropriate ATC instructions.	3	ICAO Doc 4444 *Optional content: national documents*	ALL
ACP ATM 3.2.2	Integrate appropriate ATC instructions in control service.	4		ALL
ACP ATM 3.2.3	Ensure the agreed course of action is carried out.	4		ALL

TOPIC ATM 4 — COORDINATION				
Subtopic ATM 4.1 — Necessity for coordination				
ACP ATM 4.1.1	Identify the need for coordination.	3		ALL
Subtopic ATM 4.2 — Tools and methods for coordination				
ACP ATM 4.2.1	Use the available tools for coordination.	3	*Optional content: electronic transfer of flight data, telephone, interphone, intercom, direct speech, radiotelephone (RTF), local agreements, automated system coordination*	ALL
Subtopic ATM 4.3 — Coordination procedures				
ACP ATM 4.3.1	Initiate appropriate coordination.	3	Delegation/transfer of responsibility for air–ground communications and separation, transfer of control, etc., ICAO Doc 4444 *Optional content: release point*	ALL
ACP ATM 4.3.2	Analyse effect of coordination requested by an adjacent position/unit.	4	*Optional content: delegation/transfer of responsibility for air–ground communications and separation, release point, transfer of control, etc.*	ALL
ACP ATM 4.3.3	Select, after negotiation, an appropriate course of action.	5		ALL
ACP ATM 4.3.4	Ensure the agreed course of action is carried out.	4		ALL
ACP ATM 4.3.5	Coordinate when providing FIS.	4	ICAO Doc 4444	ALL
ACP ATM 4.3.6	Coordinate when providing ALRS.	4	ICAO Doc 4444	ALL

TOPIC ATM 5 — ALTIMETRY AND LEVEL ALLOCATION				
Subtopic ATM 5.1 — Altimetry				
ACP ATM 5.1.1	Allocate levels according to altimetry data.	4		ALL
ACP ATM 5.1.2	Ensure separation according to altimetry data.	4	*Optional content: transition level, transition altitude, transition layer, height, flight level, altitude, vertical distance to airspace boundaries*	ALL
Subtopic ATM 5.2 — Terrain clearance				
ACP ATM 5.2.1	Provide planning, coordination and control actions appropriate to the rules for minimum safe levels and terrain clearance.	4	*Optional content: terrain clearance dimensions, minimum safe altitudes, transition level, minimum flight level, minimum sector altitude*	APP ACP

TOPIC ATM 6 — SEPARATIONS				
Subtopic ATM 6.1 — Vertical separation				
ACP ATM 6.1.1	Provide standard vertical separation.	4	ICAO Doc 4444, level allocation, during climb/descent, rate of climb/descent, RVSM, non-RVSM aircraft, holding pattern	ACP ACS
ACP ATM 6.1.2	Provide increased vertical separation.	4	ICAO Doc 4444, *Optional content: level allocation, during climb/descent, rate of climb/descent, degraded aircraft performance, non-RVSM aircraft, reported severe turbulence*	APP ACP APS ACS
ACP ATM 6.1.3	Appreciate the application of emergency vertical separation.	3	ICAO Doc 4444, ICAO Doc 7030	APP ACP APS ACS
Subtopic ATM 6.2 — Horizontal separation				
ACP ATM 6.2.1	Provide longitudinal separation.	4	Based on time, based on distance (DME and/or GNSS, RNAV) *Optional content: based on time with Mach number technique*	ACP
ACP ATM 6.2.2	Provide lateral separation.	4	ICAO Doc 4444, ICAO Doc 7030, holding	APP ACP
ACP ATM 6.2.3	Provide track separation.	4		ACP APP
ACP ATM 6.2.4	Provide geographical separation.	4	Visual, using navigation aids, area navigation	ACP APP

TOPIC ATM 7 — AIRBORNE COLLISION AVOIDANCE SYSTEMS AND GROUND-BASED SAFETY NETS				
Subtopic ATM 7.1 — Airborne collision avoidance systems				
ACP ATM 7.1.1	Differentiate between ACAS advisory thresholds and separation standards applicable in the area control environment.	2	ICAO Doc 9863	ACP ACS
ACP ATM 7.1.2	Describe the controller responsibility during and following an ACAS RA reported by pilot.	2	ICAO Doc 4444	ALL
ACP ATM 7.1.3	Respond to pilot notification of actions based on airborne systems warnings.	3	ACAS, TAWS	ALL

TOPIC ATM 8 — DATA DISPLAY				
Subtopic ATM 8.1 — Data management				
ACP ATM 8.1.1	Update the data display to accurately reflect the traffic situation.	3	*Optional content: information displayed, strip-marking procedures, electronic information data displays, actions based on traffic display information, calculation of EETs*	ALL
ACP ATM 8.1.2	Analyse pertinent data on data displays.	4		ALL
ACP ATM 8.1.3	Organise pertinent data on data displays.	4		ALL
ACP ATM 8.1.4	Obtain flight plan information.	3	CPL, FPL, supplementary information *Optional content: RPL, AFIL, etc.*	ALL
ACP ATM 8.1.5	Use flight plan information.	3		ALL

TOPIC ATM 9 — OPERATIONAL ENVIRONMENT (SIMULATED)				
Subtopic ATM 9.1 — Integrity of the operational environment				
ACP ATM 9.1.1	Obtain information concerning the operational environment.	3	*Optional content: briefing, notices, local orders, verification of information*	ALL
ACP ATM 9.1.2	Ensure the integrity of the operational environment.	4	*Optional content: integrity of displays, verification of the information provided by displays, etc.*	APP ACP APS ACS
Subtopic ATM 9.2 — Verification of the currency of operational procedures				
ACP ATM 9.2.1	Check all relevant documentation before managing traffic.	3	*Optional content: briefing, letters of agreement (LoAs), NOTAMs, AICs*	ALL
ACP ATM 9.2.2	Manage traffic in accordance with a change to operational procedures.	4		APP ACP APS ACS
Subtopic ATM 9.3 — Handover–takeover				
ACP ATM 9.3.1	Transfer information to the relieving controller.	3		ALL
ACP ATM 9.3.2	Obtain information from the controller handing over.	3		ALL

TOPIC ATM 10 — PROVISION OF CONTROL SERVICE				
Subtopic ATM 10.1 — Responsibility and processing of information				
ACP ATM 10.1.1	Describe the division of responsibility among air traffic control units.	2	ICAO Doc 4444	*ALL*
ACP ATM 10.1.2	Describe the responsibility in regard to military traffic.	2	ICAO Doc 4444 *Optional content: ICAO Doc 9554*	*ALL*
ACP ATM 10.1.3	Describe the responsibility in regard to unmanned free balloons.	2		APP ACP APS ACS
ACP ATM 10.1.4	Obtain operational information.	3	ICAO Doc 4444, local operation manuals	APP ACP APS ACS
ACP ATM 10.1.5	Interpret operational information.	5		APP ACP APS ACS
ACP ATM 10.1.6	Organise forwarding of operational information.	4	*Optional content: including the use of backup procedures*	APP ACP APS ACS
ACP ATM 10.1.7	Integrate operational information into control decisions.	4		APP ACP APS ACS
ACP ATM 10.1.8	Appreciate the influence of operational requirements.	3	*Optional content: military flying, calibration flights, aerial photography*	*ALL*
Subtopic ATM 10.2 — Area control				
ACP ATM 10.2.1	Explain the responsibility for the provision of area procedural control service.	2	ICAO Doc 4444, ICAO Annex 11, local operation manuals	ACP
ACP ATM 10.2.2	Provide planning, coordination and control actions appropriate to VFR and IFR traffic in VMC and IMC.	4	ICAO Annex 11, ICAO Doc 4444	ACP *APP* *APS* *ACS*
Subtopic ATM 10.3 — Traffic management process				
ACP ATM 10.3.1	Ensure that situational awareness is maintained.	4	Information gathering, traffic projection	APP ACP
ACP ATM 10.3.2	Detect conflicts in time for appropriate resolution.	4		ALL
ACP ATM 10.3.3	Identify potential solutions to achieve a safe and effective traffic flow.	3		APP ACP APS ACS

ACP ATM 10.3.4	Evaluate possible outcomes of different planning and control actions.	5		APP ACP APS ACS
ACP ATM 10.3.5	Select an appropriate plan in time to achieve safe and effective traffic flow.	5		APP ACP APS ACS
ACP ATM 10.3.6	Ensure an adequate priority of actions.	4		*ALL*
ACP ATM 10.3.7	Execute selected plan in a timely manner.	3		APP ACP APS ACS
ACP ATM 10.3.8	Ensure a safe and efficient outcome is achieved.	4	Traffic monitoring, adaptability and follow-up	ALL
Subtopic ATM 10.4 — Handling traffic				
ACP ATM 10.4.1	Manage arrivals, departures and overflights.	4		APP ACP APS ACS
ACP ATM 10.4.2	Balance the workload against personal capacity.	5	*Optional content: rerouting, replanning, prioritising solutions, denying requests, delegating responsibility for separation*	APP ACP APS ACS

TOPIC ATM 11 — HOLDING				
Subtopic ATM 11.1 — General holding procedures				
ACP ATM 11.1.1	Apply holding procedures.	3	ICAO Doc 4444, holding instructions, allocation of holding levels, onward clearance times	APP ACP APS ACS
ACP ATM 11.1.2	Appreciate the factors affecting holding patterns.	3	Effect of speed, effect of level used, effect of navigation aid in use, turbulence, aircraft type	APP ACP APS ACS
Subtopic ATM 11.2 — Holding aircraft				
ACP ATM 11.2.1	Issue expected onward clearance times.	3		ACP ACS

SUBJECT 4: METEOROLOGY

The subject objective is:

Learners shall acquire, decode and make proper use of meteorological information relevant to the provision of ATS.

TOPIC MET 1 — METEOROLOGICAL PHENOMENA				
Subtopic MET 1.1 — Meteorological phenomena				
ACP MET 1.1.1	Appreciate the impact of adverse weather on aircraft.	3	Thunderstorms, icing, jet streams, clear-air turbulence (CAT), turbulence, microburst, severe mountain waves, squall lines, volcanic ash *Optional content: solar radiation*	ACP ACS
ACP MET 1.1.2	Integrate data about meteorological phenomena into the provision of ATS.	4	Clearances, instructions and transmitted information *Optional content: relevant meteorological phenomena*	*ALL*
ACP MET 1.1.3	Use techniques to avoid adverse weather when necessary/possible.	3	Rerouting, level change, etc.	APP ACP APS ACS

TOPIC MET 2 — SOURCES OF METEOROLOGICAL DATA				
Subtopic MET 2.1 — Sources of meteorological information				
ACP MET 2.1.1	Obtain meteorological information.	3	METAR, TAF, SIGMET, AIRMET *Optional content: AIREP/ special AIREP*	APP ACP APS ACS
ACP MET 2.1.2	Relay meteorological information.	3	ICAO Doc 4444, *Optional content: flight information centre, adjacent ATS unit*	*ALL*

SUBJECT 5: NAVIGATION

The subject objective is:

Learners shall analyse all navigational aspects in order to organise the traffic.

TOPIC NAV 1 — MAPS AND AERONAUTICAL CHARTS				
Subtopic NAV 1.1 — Maps and charts				
ACP NAV 1.1.1	Use relevant maps and charts.	3		*APP* ACP *APS* ACS

TOPIC NAV 2 — INSTRUMENT NAVIGATION				
Subtopic NAV 2.1 — Navigational systems				
ACP NAV 2.1.1	Manage traffic in case of change in the operational status of navigational systems.	4	*Optional content: limitations, availability and status of ground-based and satellite-based systems*	APP ACP APS ACS
ACP NAV 2.1.2	Appreciate the effect of a change in the operational status of navigational systems.	3	*Optional content: precision, limitations, status, degraded procedures*	*ALL*
Subtopic NAV 2.2 — Navigational assistance				
ACP NAV 2.2.1	Evaluate the necessary information to be provided to pilots in need of navigational assistance.	5	*Optional content: nearest most suitable aerodrome, track, heading, distance, aerodrome information, any other navigational assistance relevant at the time*	*APP* ACP *APS* ACS
Subtopic NAV 2.3 — PBN applications				
ACP NAV 2.3.1	State the navigation applications used in terminal and en-route environments.	1	Terminal-RNAV-1 (≈P-RNAV), En-route-RNAV-5 (B-RNAV) *Optional content: A-RNP, EC PBN Implementing Rule (Commission Implementing, ICAO Doc 9613*	ACP ACS
ACP NAV 2.3.2	Explain the principles and designation of navigation specifications in use.	2	*Optional content: performance, functionality, sensors, aircrew and controller requirements*	*APP* ACP *APS* ACS
ACP NAV 2.3.3	State future PBN developments.	1	A-RNP, RNP (AR) DEP *Optional content: RNP 3D, VNAV, 4D, TBO*	*ADI APP* ACP *APS* ACS

SUBJECT 6: AIRCRAFT

The subject objective is:

Learners shall assess and integrate aircraft performance in the provision of ATS.

TOPIC ACFT 1 — AIRCRAFT INSTRUMENTS				
Subtopic ACFT 1.1 — Aircraft instruments				
ACP ACFT 1.1.1	Integrate information from aircraft instruments provided by the pilot in the provision of ATS.	4		ALL
ACP ACFT 1.1.2	Explain the operation of aircraft radio equipment.	2	*Optional content: radios (number of), emergency radios*	ALL

TOPIC ACFT 2 — AIRCRAFT CATEGORIES				
Subtopic ACFT 2.1 — Wake turbulence				
ACP ACFT 2.1.1	Explain the wake turbulence effect and associated hazards to succeeding aircraft.	2		ALL
ACP ACFT 2.1.2	Appreciate the techniques used to prevent hazards associated with wake turbulence to succeeding aircraft.	3		ALL

TOPIC ACFT 3 — FACTORS AFFECTING AIRCRAFT PERFORMANCE				
Subtopic ACFT 3.1 — Climb factors				
ACP ACFT 3.1.1	Integrate the influence of factors affecting aircraft during climb.	4	*Optional content: speed, mass, air density, cabin pressurisation, wind and temperature*	APP ACP APS ACS
Subtopic ACFT 3.2 — Cruise factors				
ACP ACFT 3.2.1	Integrate the influence of factors affecting aircraft during cruise.	4	Level, cruising speed, wind, mass, cabin pressurisation	ACP ACS
Subtopic ACFT 3.3 — Descent factors				
ACP ACFT 3.3.1	Integrate the influence of factors affecting aircraft during descent.	4	*Optional content: wind, speed, rate of descent, cabin pressurisation*	ACP ACS
Subtopic ACFT 3.4 — Economic factors				
ACP ACFT 3.4.1	Integrate consideration of economic factors affecting aircraft.	4	*Optional content: routing, level, speed, rate of climb and rate of descent, approach profile, top of descent*	ACP ACS
ACP ACFT 3.4.2	Use continuous climb techniques where applicable.	3		*APP* ACP
ACP ACFT 3.4.3	Use direct routing where applicable.	3		*APP* ACP *APS* ACS

Subtopic ACFT 3.5 — Environmental factors				
ACP ACFT 3.5.1	Appreciate the performance restrictions due to environmental considerations.	3	*Optional content: fuel-dumping, minimum flight levels, continuous descent operations*	ACP ACS

TOPIC ACFT 4 — AIRCRAFT DATA				
Subtopic ACFT 4.1 — Performance data				
ACP ACFT 4.1.1	Integrate the average performance data of a representative sample of aircraft which will be encountered in the operational/ working environment into the provision of control service.	4	Performance data under a representative variety of circumstances	APP ACP APS ACS

SUBJECT 7: HUMAN FACTORS

The subject objective is:

Learners shall recognise the necessity to constantly extend their knowledge and analyse factors which affect personal and team performance.

TOPIC HUM 1 — PSYCHOLOGICAL FACTORS				
Subtopic HUM 1.1 — Cognitive				
ACP HUM 1.1.1	Describe the human information-processing model.	2	Attention, perception, memory, situational awareness, decision-making, response	ALL
ACP HUM 1.1.2	Describe the factors which influence human information-processing.	2	Confidence, stress, learning, knowledge, experience, fatigue, alcohol/drugs, distraction, interpersonal relations	ALL
ACP HUM 1.1.3	Monitor the effect of human information-processing factors on decision-making.	3	*Optional content: workload, stress, interpersonal relations, distraction, confidence*	ALL

TOPIC HUM 2 — MEDICAL AND PHYSIOLOGICAL FACTORS				
Subtopic HUM 2.1 — Fatigue				
ACP HUM 2.1.1	State factors that cause fatigue.	1	Shift work *Optional content: night shifts and rosters, ICAO/IFATCA/CANSO's Fatigue Management Guide for Air Traffic Service Providers*	ALL
ACP HUM 2.1.2	Describe the onset of fatigue.	2	*Optional content: lack of concentration, listlessness, irritability, frustration, ICAO/IFATCA/CANSO's Fatigue Management Guide for Air Traffic Service Providers*	ALL
ACP HUM 2.1.3	Recognise the onset of fatigue in self.	1	*Optional content: ICAO/IFATCA/CANSO's Fatigue Management Guide for Air Traffic Service Providers*	ALL
ACP HUM 2.1.4	Recognise the onset of fatigue in others.	1		ALL
ACP HUM 2.1.5	Describe appropriate action when recognising fatigue.	2		ALL
Subtopic HUM 2.2 — Fitness				
ACP HUM 2.2.1	Recognise signs of lack of personal fitness.	1		ALL
ACP HUM 2.2.2	Describe actions when aware of a lack of personal fitness.	2		ALL

TOPIC HUM 3 — SOCIAL AND ORGANISATIONAL FACTORS				
Subtopic HUM 3.1 — Team resource management (TRM)				
ACP HUM 3.1.1	State the relevance of TRM.	1	*Optional content: TRM course, EUROCONTROL Guidelines for the development of TRM training*	ALL
ACP HUM 3.1.2	State the content of the TRM concept.	1	*Optional content: teamwork, human error, team roles, stress, decision-making, communication, situational awareness*	ALL
Subtopic HUM 3.2 — Teamwork and team roles				
ACP HUM 3.2.1	Identify reasons for conflict.	3		ALL
ACP HUM 3.2.2	Describe actions to prevent human conflicts.	2	*Optional content: TRM team roles*	ALL
ACP HUM 3.2.3	Describe strategies to cope with human conflicts.	2	*Optional content: in your team, in the simulator*	ALL
Subtopic HUM 3.3 — Responsible behaviour				
ACP HUM 3.3.1	Consider the factors which influence responsible behaviour.	2	*Optional content: situation, team, personal situation and judgement, instance of justification, moral motivation, personality*	ALL
ACP HUM 3.3.2	Apply responsible judgement.	3	Case study and discussion about a dilemma situation	ALL

TOPIC HUM 4 — STRESS				
Subtopic HUM 4.1 — Stress				
ACP HUM 4.1.1	Recognise the effects of stress on performance.	1	Stress and its symptoms in self and in others	ALL
Subtopic HUM 4.2 — Stress management				
ACP HUM 4.2.1	Act to reduce stress.	3	The effect of personality in coping with stress, the benefits of active stress management	ALL
ACP HUM 4.2.2	Respond to stressful situations by offering, asking or accepting assistance.	3	*Optional content: the benefits of offering, accepting and asking for help in stressful situations*	ALL
ACP HUM 4.2.3	Recognise the effect of shocking and stressful events.	1	Self and others, abnormal situations, Critical Incident Stress Management (CISM)	ALL
ACP HUM 4.2.4	Consider the benefits of Critical Incident Stress Management (CISM).	2		ALL
ACP HUM 4.2.5	Explain procedures to be used following an incident/accident.	2	*Optional content: CISM, counselling, human element*	ALL

TOPIC HUM 5 — HUMAN ERROR				
Subtopic HUM 5.1 — Human error				
ACP HUM 5.1.1	Explain the relationship between error and safety.	2	Number and combination of errors, proactive versus reactive approach to discovery of error *Optional content: ICAO Circular 314 — AN/178 Threat and Error Management (TEM) in Air Traffic Control*	ALL
ACP HUM 5.1.2	Differentiate between the types of error.	2	Slips, lapses, mistakes *Optional content: ICAO Circular 314 — AN/178 Threat and Error Management (TEM) in Air Traffic Control*	ALL
ACP HUM 5.1.3	Describe error-prone conditions.	2	*Optional content: increase in traffic, changes in procedures, complexities of systems or traffic, weather, unusual occurrences*	ALL
ACP HUM 5.1.4	Collect examples of different error types, their causes and consequences for ATC.	3	*Optional content: ICAO Circular 314 — AN/178 Threat and Error Management (TEM) in Air Traffic Control*	ALL
ACP HUM 5.1.5	Explain how to detect errors to compensate for them.	2	STCA, MSAW, individual and collective strategy *Optional content: ICAO Circular 314 — AN/178 Threat and Error Management (TEM) in Air Traffic Control*	ALL
ACP HUM 5.1.6	Execute corrective actions.	3	Error compensation *Optional content: ICAO Circular 314 — AN/178 Threat and Error Management (TEM) in Air Traffic Control*	ALL
ACP HUM 5.1.7	Explain the importance of error management.	2	*Optional content: prevention of incidents, safety improvement, revision of procedures and/or working practices*	ALL
ACP HUM 5.1.8	Describe the impact on an ATCO's performance following an occurrence/incident.	2	*Optional content: reporting, SMS, investigation, CISM*	ALL
Subtopic HUM 5.2 — Violation of rules				
ACP HUM 5.2.1	Explain the causes and dangers of violation of rules becoming accepted as a practice.	2	*Optional content: ICAO Circular 314 — AN/178 Threat and Error Management (TEM) in Air Traffic Control*	ALL

TOPIC HUM 6 — COLLABORATIVE WORK				
Subtopic HUM 6.1 — Communication				
ACP HUM 6.1.1	Use communication effectively in ATC.	3		ALL
ACP HUM 6.1.2	Analyse examples of pilot–controller communication for effectiveness.	4		ALL
Subtopic HUM 6.2 — Collaborative work within the same area of responsibility				
ACP HUM 6.2.1	List communication means between controllers in charge of the same area of responsibility (sector or tower).	1	*Optional content: electronic, written, verbal and non-verbal communication*	ALL

ACP HUM 6.2.2	Explain consequences of the use of communication means on effectiveness.	2	*Optional content: strip legibility and encoding, label designation, feedback*	ALL
ACP HUM 6.2.3	List possible actions to provide a safe position handover.	1	*Optional content: rigour, preparation, overlap time*	ALL
ACP HUM 6.2.4	Explain consequences of a missed position handover process.	2		ALL
Subtopic HUM 6.3 — Collaborative work between different areas of responsibility				
ACP HUM 6.3.1	List factors and means for an effective coordination between sectors and/or tower positions.	1	*Optional content: other sectors' constraints, electronic coordination tools*	ALL
Subtopic HUM 6.4 — Controller–pilot cooperation				
ACP HUM 6.4.1	Describe parameters affecting controller–pilot cooperation.	2	*Optional content: workload, mutual knowledge, controller versus pilot mental picture*	ALL

SUBJECT 8: EQUIPMENT AND SYSTEMS

The subject objective is:

Learners shall integrate knowledge and understanding of the basic working principles of equipment and systems, and comply with the equipment and system degradation procedures in the provision of ATS.

TOPIC EQPS 1 — VOICE COMMUNICATIONS				
Subtopic EQPS 1.1 — Radio communications				
ACP EQPS 1.1.1	Operate two-way communication equipment.	3	Transmit/receive switches, procedures *Optional content: frequency selection, standby equipment*	ALL
ACP EQPS 1.1.2	Identify indications of operational status of radio equipment.	3	*Optional content: indicator lights, serviceability displays, selector/frequency displays*	ALL
ACP EQPS 1.1.3	Consider radio range.	2	*Optional content: transfer to another frequency, apparent radio failure, failure to establish radio contact, frequency protection range*	APP ACP APS ACS
Subtopic EQPS 1.2 — Other voice communications				
ACP EQPS 1.2.1	Operate landline communications.	3	*Optional content: telephone, interphone and intercom equipment*	ALL

TOPIC EQPS 2 — AUTOMATION IN ATS				
Subtopic EQPS 2.1 — Aeronautical fixed telecommunication network (AFTN)				
ACP EQPS 2.1.1	Decode AFTN messages.	3	*Optional content: movement and control messages, NOTAMs, SNOWTAMs, BIRDTAMs, etc.*	ALL
Subtopic EQPS 2.2 — Automatic data interchange				
ACP EQPS 2.2.1	Use automatic data transfer equipment where available.	3	*Optional content: automated information and coordination, OLDI*	APP ACP

TOPIC EQPS 3 — CONTROLLER WORKING POSITION				
Subtopic EQPS 3.1 — Operation and monitoring of equipment				
ACP EQPS 3.1.1	Monitor the technical integrity of the controller working position.	3	Notification procedures, responsibilities	ALL
ACP EQPS 3.1.2	Operate the equipment of the controller working position.	3	*Optional content: situation displays, flight progress board, flight data display, radio, telephone, maps and charts, strip-printer, clock, information systems, UDF/VDF*	ALL
ACP EQPS 3.1.3	Operate available equipment in abnormal and emergency situations.	3		ALL
Subtopic EQPS 3.2 — Situation displays and information systems				
ACP EQPS 3.2.1	Use situation displays.	3		ALL

ACP EQPS 3.2.2	Check availability of information.	3		ALL
ACP EQPS 3.2.3	Obtain information from equipment.	3		APP ACP APS ACS
Subtopic EQPS 3.3 — Flight data systems				
ACP EQPS 3.3.1	Use the flight data information at controller working position.	3		ALL
TOPIC EQPS 4 — FUTURE EQUIPMENT				
Subtopic EQPS 4.1 — New developments				
ACP EQPS 4.1.1	Recognise future developments.	1	New advanced systems	ALL
TOPIC EQPS 5 — EQUIPMENT AND SYSTEMS' LIMITATIONS AND DEGRADATION				
Subtopic EQPS 5.1 — Reaction to limitations				
ACP EQPS 5.1.1	Take account of the limitations of equipment and systems.	2		ALL
ACP EQPS 5.1.2	Respond to technical deficiencies of the operational position.	3	Notification procedures, responsibilities	ALL
Subtopic EQPS 5.2 — Communication equipment degradation				
ACP EQPS 5.2.1	Identify that communication equipment has degraded.	3	*Optional content: ground–air and landline communications*	APP ACP APS ACS
ACP EQPS 5.2.2	Apply contingency procedures in the event of communication equipment degradation.	3	*Optional content: procedures for total or partial degradation of ground–air and landline communications, alternative methods of transferring data*	APP ACP APS ACS
Subtopic EQPS 5.3 — Navigational equipment degradation				
ACP EQPS 5.3.1	Identify when a navigational equipment failure will affect operational ability.	3	*Optional content: VOR, navigational aids*	ALL
ACP EQPS 5.3.2	Apply contingency procedures in the event of a navigational equipment degradation.	3	*Optional content: vertical separation, information to aircraft, navigational assistance, seeking assistance from adjacent units*	ADI APP ACP APS ACS

SUBJECT 9: PROFESSIONAL ENVIRONMENT

The subject objective is:

Learners shall identify the need for close cooperation with other parties concerning ATM operations and appreciate aspects of environmental protection.

TOPIC PEN 1 — FAMILIARISATION				
Subtopic PEN 1.1 — Study visit to an area control centre				
ACP PEN 1.1.1	Appreciate the functions and provision of operational area control service.	3	Study visit to an area control centre	ACP ACS

TOPIC PEN 2 — AIRSPACE USERS				
Subtopic PEN 2.1 — Contributors to civil ATS operations				
ACP PEN 2.1.1	Characterise civil ATS activities in area control centre.	2	Study visit to an area control centre *Optional content: familiarisation visits to TWR, APP, AIS, RCC*	ACP ACS
ACP PEN 2.1.2	Characterise other parties interfacing with ATS operations.	2	*Optional content: familiarisation visits to engineering services, firefighting and emergency services, airline operations offices*	ALL
Subtopic PEN 2.2 — Contributors to military ATS operations				
ACP PEN 2.2.1	Characterise military ATS activities.	2	*Optional content: familiarisation visits to TWR, APP, ACC, AIS, RCC, Air Defence Units*	ALL

TOPIC PEN 3 — CUSTOMER RELATIONS				
Subtopic PEN 3.1 — Provision of services and user requirements				
ACP PEN 3.1.1	Identify the role of ATC as a service provider.	3		ALL
ACP PEN 3.1.2	Appreciate ATS users' requirements.	3		ALL

TOPIC PEN 4 — ENVIRONMENTAL PROTECTION				
Subtopic PEN 4.1 — Environmental protection				
ACP PEN 4.1.1	Appreciate the mitigation techniques used en-route to minimise the aviation's impact on the environment.	3	*Optional content: free route airspace (FRA), night/weekend routes, ICAO Circular 303 — Operational Opportunities to Minimize Fuel Use and Reduce Emissions*	ACP ACS

SUBJECT 10: ABNORMAL AND EMERGENCY SITUATIONS

The subject objective is:

Learners shall develop a professional attitude to manage traffic in abnormal and emergency situations.

TOPIC ABES 1 — ABNORMAL AND EMERGENCY SITUATIONS (ABES)				
Subtopic ABES 1.1 — Overview of ABES				
ACP ABES 1.1.1	List common abnormal and emergency situations.	1	*Optional content: EATM Guidelines for Controller Training in the Handling of Unusual/Emergency Situations, ambulance flights, ground-based safety nets alerts, airframe failure, unreliable instruments, runway incursion*	ALL
ACP ABES 1.1.2	Identify potential or actual abnormal and emergency situations.	3		ALL
ACP ABES 1.1.3	Take into account the procedures for given abnormal and emergency situations.	2	*Optional content: ICAO Doc 4444*	APP ACP APS ACS
ACP ABES 1.1.4	Take into account that procedures do not exist for all abnormal and emergency situations.	2	*Optional content: real-life examples*	ALL
ACP ABES 1.1.5	Consider how the evolution of a situation may have an impact on safety.	2	*Optional content: separation, information, coordination*	ALL

TOPIC ABES 2 — SKILLS IMPROVEMENT				
Subtopic ABES 2.1 — Communication effectiveness				
ACP ABES 2.1.1	Ensure effective communication in all circumstances including the case where standard phraseology is not applicable.	4	Phraseology, vocabulary, readback, radio silence instruction	ALL
Subtopic ABES 2.2 — Avoidance of mental overload				
ACP ABES 2.2.1	Describe actions to keep the situation under control.	2	*Optional content: sector-splitting, holding, flow management, task delegation*	ALL
ACP ABES 2.2.2	Organise priority of actions.	4		ALL
ACP ABES 2.2.3	Ensure effective dissemination of information.	4	*Optional content: between executive and planner/coordinator, with the supervisor, between sectors, between ACC, APP and TWR, with ground staff, etc.*	ALL
ACP ABES 2.2.4	Consider asking for help.	2		ALL

Subtopic ABES 2.3 — Air–ground cooperation				
ACP ABES 2.3.1	Collect appropriate information relevant to the situation.	3		ALL
ACP ABES 2.3.2	Assist the pilot.	3	Pilot workload *Optional content: instructions, information, support, human factors, etc.*	ALL
TOPIC ABES 3 — PROCEDURES FOR ABNORMAL AND EMERGENCY SITUATIONS (ABES)				
Subtopic ABES 3.1 — Application of procedures for ABES				
ACP ABES 3.1.1	Apply the procedures for given abnormal and emergency situations.	3	*Optional content: EATM Guidelines for Controller Training in the Handling of Unusual/Emergency Situations, ambulance flights, ground-based safety nets alerts, airframe failure*	ALL
Subtopic ABES 3.2 — Radio failure				
ACP ABES 3.2.1	Describe the procedures to be followed by a pilot when that pilot experiences complete or partial radio failure.	2	*Optional content: ICAO Doc 4444, military procedures*	ALL
ACP ABES 3.2.2	Apply the procedures to be followed when a pilot experiences complete or partial radio failure.	3	*Optional content: prolonged loss of communication*	ALL
Subtopic ABES 3.3 — Unlawful interference and aircraft bomb threat				
ACP ABES 3.3.1	Apply ATC procedures associated with unlawful interference and aircraft bomb threat.	3		ALL
Subtopic ABES 3.4 — Strayed or unidentified aircraft				
ACP ABES 3.4.1	Apply the procedures in the case of strayed aircraft.	3	*Optional content: inside controlled airspace, outside controlled airspace*	ALL
ACP ABES 3.4.2	Apply the procedures in the case of unidentified aircraft.	3		ALL
Subtopic ABES 3.5 — Diversions				
ACP ABES 3.5.1	Provide navigational assistance to aircraft diverting in emergency.	4	Track/heading, distance, other navigational assistance *Optional content: nearest most suitable aerodrome*	APP ACP APS ACS

AMC1 ATCO.D.010(a)(2)(v) Composition of initial training

APPROACH CONTROL SURVEILLANCE RATING (APS) TRAINING — SUBJECT OBJECTIVES AND TRAINING OBJECTIVES

(a) The general principles that apply to this AMC are contained in AMC1 ATCO.D.010(a).

(b) The ATCO Rating training Approach Control Surveillance Rating (APS) should contain the following subject objectives and training objectives that are associated with the subjects, topics and subtopics contained in Appendix 7 to TCAR PEL Part ATCO.

(c) Subjects, topics and subtopics from Appendix 7 to TCAR PEL Part ATCO are repeated in this AMC for the convenience of the reader and do not form part of it.

SUBJECT 1: INTRODUCTION TO THE COURSE

The subject objective is:

Learners shall know and understand the training programme that they will follow and learn how to obtain the appropriate information.

TOPIC INTR 1 — COURSE MANAGEMENT				
Subtopic INTR 1.1 — Course introduction				
APS INTR 1.1.1	Explain the aims and main objectives of the course.	2		ALL
Subtopic INTR 1.2 — Course administration				
APS INTR 1.2.1	State how the course is administered.	1		ALL
Subtopic INTR 1.3 — Study material and training documentation				
APS INTR 1.3.1	Use appropriate documents and their sources for course studies.	3	*Optional content: training documentation, library, CBT library, web, learning management server*	ALL
APS INTR 1.3.2	Integrate appropriate information into course studies.	4	Training documentation *Optional content: supplementary information, library*	ALL

TOPIC INTR 2 — INTRODUCTION TO THE ATC TRAINING COURSE				
Subtopic INTR 2.1 — Course content and organisation				
APS INTR 2.1.1	State the different training methods used during the course.	1	Theoretical training, practical training, self-study, types of training events	ALL
APS INTR 2.1.2	State the subjects covered by the course and their purpose.	1		ALL
APS INTR 2.1.3	Describe the organisation of theoretical training.	2	*Optional content: course programme*	ALL
APS INTR 2.1.4	Describe the organisation of practical training.	2	*Optional content: PTP, simulation, briefing, debriefing, course programme*	ALL

Subtopic INTR 2.2 — Training ethos				
APS INTR 2.2.1	Recognise the feedback mechanisms available.	1	Training progress, assessment, briefing, debriefing, learner–instructor feedback, instructor–instructor feedback	ALL
Subtopic INTR 2.3 — Assessment process				
APS INTR 2.3.1	Describe the assessment process.	2		ALL

SUBJECT 2: AVIATION LAW

The subject objective is:

Learners shall know, understand and apply the Rules of the Air and the Regulations regarding reporting and airspace, and appreciate the Licensing and Competence principles.

TOPIC LAW 1 — ATCO LICENSING/CERTIFICATE OF COMPETENCE				
Subtopic LAW 1.1 — Privileges and conditions				
APS LAW 1.1.1	Appreciate the conditions which shall be met to issue an Approach Control Surveillance rating.	3	Relevant national regulation on ATCO Licensing *Optional content: national documents*	APS
APS LAW 1.1.2	Explain how to maintain and update professional knowledge and skills to retain competence in the operational environment.	2		ALL
APS LAW 1.1.3	Explain the conditions for suspension/ revocation of an ATCO licence.	2	Relevant national regulation on ATCO Licensing	ALL

TOPIC LAW 2 — RULES AND REGULATIONS				
Subtopic LAW 2.1 — Reports				
APS LAW 2.1.1	List the standard forms for reports.	1	Air traffic incident report *Optional content: routine air-reports, breach of regulations, watchbook/logbook, records*	ALL
APS LAW 2.1.2	Describe the functions of, and processes for, reporting.	2	Reporting culture, air traffic incident report *Optional content: breach of regulations, watchbook/logbook, records, voluntary reporting*	ALL
APS LAW 2.1.3	Use forms for reporting.	3	air traffic incident reporting form(s) *Optional content: routine air-reports, breach of regulations, watchbook/logbook, records*	ALL
Subtopic LAW 2.2 — Airspace				
APS LAW 2.2.1	Appreciate airspace classes and structure and their relevance to operations using the Approach Control Surveillance rating.	3		APS
APS LAW 2.2.2	Provide planning, coordination and control actions appropriate to the classification and structure of airspace.	4	*Optional content: international requirements, civil requirements, military requirements, areas of responsibility, sectorisation, national requirements*	ALL
APS LAW 2.2.3	Appreciate responsibility for terrain clearance.	3		ALL

TOPIC LAW 3 — ATC SAFETY MANAGEMENT				
Subtopic LAW 3.1 — Feedback process				
APS LAW 3.1.1	State the importance of controller contribution to the feedback process.	1	*Optional content: voluntary reporting*	ALL
APS LAW 3.1.2	Describe how reported occurrences are analysed.	2	Relevant national regulations *Optional content: local procedures*	ALL
APS LAW 3.1.3	Name the means used to disseminate recommendations.	1	*Optional content: safety letters, safety boards web pages*	ALL
APS LAW 3.1.4	Appreciate the 'Just Culture' concept.	3	Benefits, prerequisites, constraints *Optional content:* *https://www.skybrary.aero*	ALL
Subtopic LAW 3.2 — Safety Investigation				
APS LAW 3.2.1	Describe role and mission of Safety Investigation in the improvement of safety.	2		ALL
APS LAW 3.2.2	Define working methods of Safety Investigation.	1		ALL

SUBJECT 3: AIR TRAFFIC MANAGEMENT

The subject objective is:

Learners shall manage air traffic to ensure safe, orderly and expeditious services.

TOPIC ATM 1 — PROVISION OF SERVICES				
Subtopic ATM 1.1 — Air traffic control (ATC) service				
APS ATM 1.1.1	Appreciate own area of responsibility.	3		APP ACP APS ACS
APS ATM 1.1.2	Provide approach control service.	4	ICAO Annex 11, ICAO Doc 7030, ICAO Doc 4444, operation manuals	APP APS
Subtopic ATM 1.2 — Flight information service (FIS)				
APS ATM 1.2.1	Provide FIS.	4	ICAO Doc 4444, *Optional content: national documents*	*ALL*
APS ATM 1.2.2	Use an ATS surveillance system in the provision of FIS.	3	ICAO Doc 4444, information to identified aircraft concerning: traffic, navigation *Optional content: weather*	APS ACS
APS ATM 1.2.3	Issue appropriate information concerning the position of conflicting traffic.	3	ICAO Doc 4444, traffic information, essential traffic information	APS ACS *APP* *ACP*
APS ATM 1.2.4	Appreciate the use of ATIS in the provision of flight information service.	3		APS *APP*
Subtopic ATM 1.3 — Alerting service (ALRS)				
APS ATM 1.3.1	Provide ALRS.	4	ICAO Doc 4444, *Optional content: national documents*	ALL
APS ATM 1.3.2	Respond to distress and urgency messages and signals.	3	ICAO Annex 10, ICAO Doc 4444 *Optional content: EUROCONTROL Guidelines for Controller Training in the Handling of Unusual/Emergency Situations*	ALL
APS ATM 1.3.3	Use an ATS surveillance system in the provision of ALRS.	3		APS ACS
Subtopic ATM 1.4 — ATS system capacity and air traffic flow management				
APS ATM 1.4.1	Appreciate the impact of ATS system capacity and air traffic flow management on the controller.	3	*Optional content: EUROCONTROL ATFCM Users Manual, FABs, FUA, free route airspace, local implementation of ATFCM principles, etc.*	APP ACP APS ACS
APS ATM 1.4.2	Apply flow management procedures in the provision of ATC.	3	*Optional content: EUROCONTROL ATFCM Users Manual*	APP ACP APS ACS

APS ATM 1.4.3	Organise traffic flows and patterns to take account of airspace boundaries.	4	*Optional content: civil and military, controlled, uncontrolled, advisory, restricted, danger, prohibited, special rules, sector boundaries, national boundaries, FIR boundaries, delegated airspace, transfer of control, transfer of communications, en-route, off-route*	APP ACP APS ACS
APS ATM 1.4.4	Organise traffic flows and patterns to take account of areas of responsibility.	4	*Optional content: EUROCONTROL ATFCM Users Manual*	APP ACP APS ACS
APS ATM 1.4.5	Inform supervisor of local factors affecting ATS system capacity and air traffic flow management.	3	*Optional content: abnormal situations, decrease in sector capacity, limitations on systems and equipment, changes in workload/capacity, unusual meteorological conditions, relevant information like: reported ground-based incidents, forest fire, smoke, oil pollution*	APP ACP APS ACS
APS ATM 1.4.6	Organise traffic flows and patterns to take account of ATS surveillance system capability.	4		APS ACS
Subtopic ATM 1.5 — Airspace management (ASM)				
APS ATM 1.5.1	Appreciate the impact of ASM on the controller.	3	*Optional content: FABs, EUROCONTROL Specification for the application of FUA, TSAs, CDRs, CBAs, free route airspace*	APP ACP APS ACS
APS ATM 1.5.2	Organise traffic to take account of ASM.	4	Real-time activation, deactivation or reallocation of airspace *Optional content: CDR, TSA, TRA, CBA*	APS *ACS*
TOPIC ATM 2 — COMMUNICATION				
Subtopic ATM 2.1 — Effective communication				
APS ATM 2.1.1	Use approved phraseology.	3	ICAO Doc 4444 and ICAO Doc 9432	ALL
APS ATM 2.1.2	Ensure effective communication.	4	Communication techniques, readback/verification of readback	ALL
TOPIC ATM 3 — ATC CLEARANCES AND ATC INSTRUCTIONS				
Subtopic ATM 3.1 — ATC clearances				
APS ATM 3.1.1	Issue appropriate ATC clearances.	3	*Optional content: ICAO Doc 4444, national documents*	ALL
APS ATM 3.1.2	Integrate appropriate ATC clearances in control service.	4		ALL
APS ATM 3.1.3	Ensure the agreed course of action is carried out.	4		ALL

Subtopic ATM 3.2 — ATC instructions				
APS ATM 3.2.1	Issue appropriate ATC instructions.	3	ICAO Doc 4444 *Optional content: national documents*	ALL
APS ATM 3.2.2	Integrate appropriate ATC instructions in control service.	4		ALL
APS ATM 3.2.3	Ensure the agreed course of action is carried out.	4		ALL

TOPIC ATM 4 — COORDINATION				
Subtopic ATM 4.1 — Necessity for coordination				
APS ATM 4.1.1	Identify the need for coordination.	3		ALL
Subtopic ATM 4.2 — Tools and methods for coordination				
APS ATM 4.2.1	Use the available tools for coordination.	3	*Optional content: electronic transfer of flight data, telephone, interphone, intercom, direct speech, radiotelephone (RTF), local agreements, automated system coordination*	ALL
Subtopic ATM 4.3 — Coordination procedures				
APS ATM 4.3.1	Initiate appropriate coordination.	3	Delegation/transfer of responsibility for air–ground communications and separation, transfer of control, etc., ICAO Doc 4444 *Optional content: release point*	ALL
APS ATM 4.3.2	Analyse effect of coordination requested by an adjacent position/unit.	4	*Optional content: delegation/transfer of responsibility for air–ground communications and separation, release point, transfer of control, etc.*	ALL
APS ATM 4.3.3	Select, after negotiation, an appropriate course of action.	5		ALL
APS ATM 4.3.4	Ensure the agreed course of action is carried out.	4		ALL
APS ATM 4.3.5	Coordinate when providing FIS.	4	ICAO Doc 4444	ALL
APS ATM 4.3.6	Coordinate when providing ALRS.	4	ICAO Doc 4444	ALL

TOPIC ATM 5 — ALTIMETRY AND LEVEL ALLOCATION				
Subtopic ATM 5.1 — Altimetry				
APS ATM 5.1.1	Allocate levels according to altimetry data.	4		ALL
APS ATM 5.1.2	Ensure separation according to altimetry data.	4	*Optional content: transition level, transition altitude, transition layer, height, flight level, altitude, vertical distance to airspace boundaries*	ALL
Subtopic ATM 5.2 — Terrain clearance				
APS ATM 5.2.1	Provide planning, coordination and control actions appropriate to the rules for minimum safe levels and terrain clearance.	4	*Optional content: minimum vectoring altitude, terrain clearance dimensions, minimum safe altitudes, transition level, minimum flight level, minimum sector altitude*	APS ACS

TOPIC ATM 6 — SEPARATIONS				
Subtopic ATM 6.1 — Vertical separation				
APS ATM 6.1.1	Provide standard vertical separation.	4	ICAO Doc 4444, level allocation, during climb/descent, rate of climb/descent, holding pattern	APP APS
APS ATM 6.1.2	Provide increased vertical separation.	4	ICAO Doc 4444 *Optional content: level allocation, during climb/descent, rate of climb/descent, degraded aircraft performance, non-RVSM aircraft, reported severe turbulence*	APP ACP APS ACS
APS ATM 6.1.3	Appreciate the application of emergency vertical separation.	3	ICAO Doc 4444, ICAO Doc 7030	APP ACP APS ACS
APS ATM 6.1.4	Provide vertical separation in a surveillance environment.	4	Pressure altitude-derived information, pilot-level reports *Optional content: into/out of ATS surveillance system coverage*	APS ACS
Subtopic ATM 6.2 — Longitudinal separation in a surveillance environment				
APS ATM 6.2.1	Provide longitudinal separation in a surveillance environment.	4	Successive departures, successive arrivals, overflights, speed control, silent transfer, ICAO Doc 4444	APS
Subtopic ATM 6.3 — Delegation of separation				
APS ATM 6.3.1	Delegate separation to pilots in the case of aircraft executing successive visual approaches.	4		APP APS
APS ATM 6.3.2	Appreciate the conditions which must be met when delegating separation to pilots to fly maintaining own separation while in VMC.	3	ICAO Doc 4444	APP APS
Subtopic ATM 6.4 — Wake turbulence distance-based separation				
APS ATM 6.4.1	Provide distance-based wake turbulence separation.	4	ICAO Doc 4444, *Optional content: EASA SIB 2017-10 'En-route Wake Turbulence Encounters', national documents*	APS *ACS*

Subtopic ATM 6.5 — Separation based on ATS surveillance systems				
APS ATM 6.5.1	Describe how separation based on ATS surveillance systems is applied.	2	ICAO Doc 4444	APS *ACS*
APS ATM 6.5.2	Provide horizontal separation.	4	ICAO Doc 4444, ICAO Doc 7030, local operation manuals, holding	APS *ACS*
APS ATM 6.5.3	Provide horizontal separation by vectoring in a variety of situations.	4	*Optional content: transit, meteorological phenomena, vectoring for approach, departure versus transit versus arrival*	APS *ACS*
APS ATM 6.5.4	Ensure horizontal or vertical separation from airspace boundaries.	4	Adjacent sectors, restricted, prohibited and danger areas, TSAs	APS *ACS*
TOPIC ATM 7 — AIRBORNE COLLISION AVOIDANCE SYSTEMS AND GROUND-BASED SAFETY NETS				
Subtopic ATM 7.1 — Airborne collision avoidance systems				
APS ATM 7.1.1	Differentiate between ACAS advisory thresholds and separation standards applicable in the approach control environment.	2	ICAO Doc 9863	APP APS
APS ATM 7.1.2	Describe the controller responsibility during and following an ACAS RA reported by pilot.	2	ICAO Doc 4444	ALL
APS ATM 7.1.3	Respond to pilot notification of actions based on airborne systems warnings.	3	ACAS, TAWS	ALL
Subtopic ATM 7.2 — Ground-based safety nets				
APS ATM 7.2.1	Describe the controller responsibility during and following safety net warnings.	2	ICAO Doc 4444 Optional content: STCA, MSAW, APW, APM	APS ACS
APS ATM 7.2.2	Respond to ground-based safety net warnings.	3	Optional content: STCA, MSAW, APW, APM	APS ACS
TOPIC ATM 8 — DATA DISPLAY				
Subtopic ATM 8.1 — Data management				
APS ATM 8.1.1	Update the data display to accurately reflect the traffic situation.	3	*Optional content: information displayed, strip-marking procedures, electronic information data displays, actions based on traffic display information, calculation of EETs*	ALL
APS ATM 8.1.2	Analyse pertinent data on data displays.	4		ALL
APS ATM 8.1.3	Organise pertinent data on data displays.	4		ALL
APS ATM 8.1.4	Obtain flight plan information.	3	CPL, FPL, supplementary information Optional content: RPL, AFIL, etc.	ALL
APS ATM 8.1.5	Use flight plan information.	3		ALL

TOPIC ATM 9 — OPERATIONAL ENVIRONMENT (SIMULATED)				
Subtopic ATM 9.1 — Integrity of the operational environment				
APS ATM 9.1.1	Obtain information concerning the operational environment.	3	*Optional content: briefing, notices, local orders, verification of information*	ALL
APS ATM 9.1.2	Ensure the integrity of the operational environment.	4	*Optional content: integrity of displays, verification of the information provided by displays, etc.*	APP ACP APS ACS
Subtopic ATM 9.2 — Verification of the currency of operational procedures				
APS ATM 9.2.1	Check all relevant documentation before managing traffic.	3	*Optional content: briefing, letters of agreement (LoAs), NOTAMs, AICs*	ALL
APS ATM 9.2.2	Manage traffic in accordance with a change to operational procedures.	4		APP ACP APS ACS
Subtopic ATM 9.3 — Handover–takeover				
APS ATM 9.3.1	Transfer information to the relieving controller.	3		ALL
APS ATM 9.3.2	Obtain information from the controller handing over.	3		ALL

TOPIC ATM 10 — PROVISION OF CONTROL SERVICE				
Subtopic ATM 10.1 — Responsibility and processing of information				
APS ATM 10.1.1	Describe the division of responsibility among air traffic control units.	2	ICAO Doc 4444	*ALL*
APS ATM 10.1.2	Describe the responsibility in regard to military traffic.	2	ICAO Doc 4444 *Optional content: ICAO Doc 9554*	*ALL*
APS ATM 10.1.3	Describe the responsibility in regard to unmanned free balloons.	2		APP ACP APS ACS
APS ATM 10.1.4	Obtain operational information.	3	ICAO Doc 4444, local operation manuals	APP ACP APS ACS
APS ATM 10.1.5	Interpret operational information.	5		APP ACP APS ACS
APS ATM 10.1.6	Organise forwarding of operational information.	4	*Optional content: including the use of backup procedures*	APP ACP APS ACS
APS ATM 10.1.7	Integrate operational information into control decisions.	4		APP ACP APS ACS

APS ATM 10.1.8	Appreciate the influence of operational requirements.	3	*Optional content: military flying, calibration flights, aerial photography*	*ALL*
Subtopic ATM 10.2 — ATS surveillance service				
APS ATM 10.2.1	Explain the responsibility for the provision of ATS surveillance service appropriate to APS rating.	2	ICAO Doc 4444, ICAO Annex 11, local operation manuals	APS
APS ATM 10.2.2	Explain the functions that may be performed with the use of ATS surveillance system derived information presented on a situation display.	2	ICAO Doc 4444	APS ACS
APS ATM 10.2.3	Provide planning, coordination and control actions appropriate to VFR, SVFR and IFR traffic in VMC and IMC.	4	ICAO Annex 11, ICAO Doc 4444	APS *APP* *ACP* *ACS*
APS ATM 10.2.4	Apply the procedures for termination of ATS surveillance service.	3	ICAO Doc 4444 *Optional content: transfer of control, termination or interruption of ATS surveillance service*	APS ACS
Subtopic ATM 10.3 — Traffic management process				
APS ATM 10.3.1	Ensure that situational awareness is maintained.	4	Information gathering, scanning, traffic projection	APS ACS
APS ATM 10.3.2	Detect conflicts in time for appropriate resolution.	4		ALL
APS ATM 10.3.3	Identify potential solutions to achieve a safe and effective traffic flow.	3		APP ACP APS ACS
APS ATM 10.3.4	Evaluate possible outcomes of different planning and control actions.	5		APP ACP APS ACS
APS ATM 10.3.5	Select an appropriate plan in time to achieve safe and effective traffic flow.	5		APP ACP APS ACS
APS ATM 10.3.6	Ensure an adequate priority of actions.	4		*ALL*
APS ATM 10.3.7	Execute selected plan in a timely manner.	3		APP ACP APS
APS ATM 10.3.8	Ensure a safe and efficient outcome is achieved.	4	Traffic monitoring, adaptability and follow-up	ALL

Subtopic ATM 10.4 — Handling traffic				
APS ATM 10.4.1	Manage arrivals, departures and overflights.	4		APP ACP APS ACS
APS ATM 10.4.2	Balance the workload against personal capacity.	5	*Optional content: rerouting, replanning, prioritising solutions, denying requests, delegating responsibility for separation*	APP ACP APS ACS
APS ATM 10.4.3	Define flight path monitoring and vectoring.	1	ICAO Doc 4444	APS ACS
APS ATM 10.4.4	Explain the requirements for vectoring and termination of vectoring.	2	ICAO Doc 4444	APS ACS
APS ATM 10.4.5	Provide vectoring.	4	ICAO Doc 4444, *Optional content: separation, expediting arrivals, departures and/or climb to cruising levels, aircraft leaving the hold, navigation assistance, uncontrolled airspace, etc.*	APS ACS
APS ATM 10.4.6	Apply the procedures for termination of vectoring.	3	ICAO Doc 4444,	APS ACS
APS ATM 10.4.7	Manage traffic on different types of approaches.	4	Precision, non-precision, visual	*APP* APS
APS ATM 10.4.8	Initiate missed approach.	3	ICAO Doc 4444, *Optional content: https://www.skybrary.aero*	*APP* APS
APS ATM 10.4.9	Integrate aircraft on missed approach into the traffic situation.	4		*APP* APS
Subtopic ATM 10.5 — Control service with advanced system support				
APS ATM 10.5.1	Appreciate the impact of advanced systems on the provision of approach control service.	3	*Optional content: sequencing systems, arrival management, departure management, automated holding lists, vertical traffic displays, conflict detection and decision-making tools, automated information and coordination tools*	APS

TOPIC ATM 11 — HOLDING				
Subtopic ATM 11.1 — General holding procedures				
APS ATM 11.1.1	Apply holding procedures.	3	ICAO Doc 4444, holding instructions, allocation of holding levels, onward clearance times	APP ACP APS ACS
APS ATM 11.1.2	Appreciate the factors affecting holding patterns.	3	Effect of speed, effect of level used, effect of navigation aid in use, turbulence, aircraft type	APP ACP APS ACS
Subtopic ATM 11.2 — Approaching aircraft				
APS ATM 11.2.1	Issue Expected Approach Times (EATs).	3		APP APS
APS ATM 11.2.2	Organise the traffic landing sequence in a holding pattern.	4	*Optional content: company preference, aircraft performance, aircraft approach capability, ILS categories, flow control management*	APP APS
Subtopic ATM 11.3 — Holding in a surveillance environment				
APS ATM 11.3.1	Organise traffic to separate other aircraft from holding aircraft.	4		APS ACS
APS ATM 11.3.2	Integrate system support, when available.	4	*Optional content: arrival management system, automated holding lists, vertical traffic displays*	APS ACS

TOPIC ATM 12 — IDENTIFICATION				
Subtopic ATM 12.1 — Establishment of identification				
APS ATM 12.1.1	Appreciate the precautions when establishing identification.	3		APS ACS
APS ATM 12.1.2	Identify aircraft.	3	*Optional content: PSR, SSR or ADS identification method*	APS ACS
APS ATM 12.1.3	Apply the procedures in the case of misidentification.	3		APS ACS
Subtopic ATM 12.2 — Maintenance of identification				
APS ATM 12.2.1	Appreciate the necessity to maintain identification.	3		APS ACS
Subtopic ATM 12.3 — Loss of identity				
APS ATM 12.3.1	Appreciate when an aircraft identification is lost or in doubt.	3	*Optional content: out of ATS surveillance system coverage, failure of ATS surveillance system, weather clutter, other clutter, garbling, holding, etc.*	APS ACS
APS ATM 12.3.2	Apply methods to re-establish identification.	3		APS ACS

TOPIC ATM 12 — IDENTIFICATION				
APS ATM 12.3.3	Respond to loss/doubt concerning identification.	3	*Optional content: procedural separation*	APS ACS
Subtopic ATM 12.4 — Position information				
APS ATM 12.4.1	Appreciate the circumstances when position information should be passed on to aircraft.	3		APS ACS
APS ATM 12.4.2	State the format in which position information can be passed on to aircraft.	1	ICAO Doc 4444	APS ACS
Subtopic ATM 12.5 — Transfer of identity				
APS ATM 12.5.1	Apply the methods of transfer of identification.	3		APS ACS
APS ATM 12.5.2	Appreciate the precautions when transferring identification.	3		APS ACS

SUBJECT 4: METEOROLOGY

The subject objective is:

Learners shall acquire, decode and make proper use of meteorological information relevant to the provision of ATS.

TOPIC MET 1 — METEOROLOGICAL PHENOMENA				
Subtopic MET 1.1 — Meteorological phenomena				
APS MET 1.1.1	Appreciate the impact of adverse weather on aircraft.	3	Thunderstorms, icing, clear-air turbulence (CAT), turbulence, microburst, wind shear, severe mountain waves, squall lines, volcanic ash	APP APS
APS MET 1.1.2	Integrate data about meteorological phenomena into the provision of ATS.	4	Clearances, instructions and transmitted information *Optional content: relevant meteorological phenomena*	*ALL*
APS MET 1.1.3	Use techniques to avoid adverse weather when necessary/possible.	3	Rerouting, level change, etc.	APP ACP APS ACS

TOPIC MET 2 — SOURCES OF METEOROLOGICAL DATA				
Subtopic MET 2.1 — Sources of meteorological information				
APS MET 2.1.1	Obtain meteorological information.	3	METAR, TAF, SIGMET, AIRMET *Optional content: AIREP/special AIREP*	APP ACP APS ACS
APS MET 2.1.2	Relay meteorological information.	3	ICAO Doc 4444, *Optional content: flight information centre, adjacent ATS unit*	*ALL*

SUBJECT 5: NAVIGATION

The subject objective is:

Learners shall analyse all navigational aspects in order to organise the traffic.

TOPIC NAV 1 — MAPS AND AERONAUTICAL CHARTS				
Subtopic NAV 1.1 — Maps and charts				
APS NAV 1.1.1	Decode symbols and information displayed on aeronautical maps and charts.	3	Instrument approach charts, SID & STAR charts, aerodrome charts *Optional content: visual approach charts, military maps and charts*	ADI APP APS
APS NAV 1.1.2	Use relevant maps and charts.	3		APP *ACP* APS *ACS*

TOPIC NAV 2 — INSTRUMENT NAVIGATION				
Subtopic NAV 2.1 — Navigational systems				
APS NAV 2.1.1	Manage traffic in case of change in the operational status of navigational systems.	4	*Optional content: limitations, availability and status of ground-based and satellite-based systems*	APP ACP APS ACS
APS NAV 2.1.2	Appreciate the effect of a change in the operational status of navigational systems.	3	*Optional content: precision, limitations, status, degraded procedures*	*ALL*
Subtopic NAV 2.2 — Stabilised approach				
APS NAV 2.2.1	Describe the concept of stabilised approach.	2	*Optional content: https://www.skybrary.aero*	ADV ADI APP APS
APS NAV 2.2.2	Appreciate the effect of late change of runway-in-use or type of approach for landing aircraft.	3	Cockpit workload *Optional content: impact on vertical profile (CDO), FMS management, crew procedure briefing, missed approach, loss of situational awareness, etc.*	APP APS
APS NAV 2.2.3	Appreciate controller actions that may contribute to an unstabilised approach.	3	Inappropriate speed control, vectoring for short final, vectoring for approach with significant tailwind, glide path interception from above, lack or incorrect distance to touchdown information, delayed descent, incorrect use of 'DIRECT TO'	APS
Subtopic NAV 2.3 — Instrument departures and arrivals				
APS NAV 2.3.1	Describe relevant SIDs and STARs.	2		ADI APP APS
APS NAV 2.3.2	Describe the types and phases of instrument approach procedures.	2		APP APS

APS NAV 2.3.3	Describe the relevant minima applicable for a precision/non-precision and visual approach.	2	*Optional content: Type A/B operations, CAT I/II/III criteria, LNAV, LNAV/VNAV, LPV, RNP AR APCH minima*	ADI APP APS
Subtopic NAV 2.4 — Navigational assistance				
APS NAV 2.4.1	Evaluate the necessary information to be provided to pilots in need of navigational assistance.	5	*Optional content: nearest most suitable aerodrome, track, heading, distance, aerodrome information, any other navigational assistance relevant at the time*	APP *ACP* APS *ACS*
APS NAV 2.4.2	Assist pilots with navigation when required.	3	Aircraft observed to be deviating from their known intended route, on pilots' request	APS *ACS*
Subtopic NAV 2.5 — Satellite-based systems				
APS NAV 2.5.1	State the different applications of satellite-based systems relevant for approach operations.	1	RNP APCH, RNP AR APCH, SBAS, GBAS *Optional content: LNAV, LNAV/VNAV LPV, RNP minima, precision approach*	APP APS
Subtopic NAV 2.6 — PBN applications				
APS NAV 2.6.1	State the navigation applications used in approach and terminal environments.	1	Approach-RNP APCH/ RNP AR APCH, Terminal-RNAV-1 RNP 1 with RF, rotorcraft option RNP 0.3 *Optional content: ICAO Doc 9613*	APP APS
APS NAV 2.6.2	Explain the principles and designation of navigation specifications in use.	2	Performance, functionalities, sensors *Optional content: aircrew and controller requirements, accuracy requirements, integrity and continuity*	APP *ACP* APS *ACS*
APS NAV 2.6.3	State future PBN developments.	1	A-RNP, RNP (AR) DEP *Optional content: RNP 3D, VNAV, RNP 4D, TBO*	*ADI* APP *ACP* APS *ACS*

SUBJECT 6: AIRCRAFT

The subject objective is:

Learners shall assess and integrate aircraft performance in the provision of ATS.

TOPIC ACFT 1 — AIRCRAFT INSTRUMENTS				
Subtopic ACFT 1.1 — Aircraft instruments				
APS ACFT 1.1.1	Integrate information from aircraft instruments provided by the pilot in the provision of ATS.	4		ALL
APS ACFT 1.1.2	Explain the operation of aircraft radio equipment.	2	*Optional content: radios (number of), emergency radios*	ALL
APS ACFT 1.1.3	Explain the operation of on-board surveillance equipment.	2	Transponders: equipment Mode A, Mode C, Mode S, ADS capability	ADI APS ACS

TOPIC ACFT 2 — AIRCRAFT CATEGORIES				
Subtopic ACFT 2.1 — Wake turbulence				
APS ACFT 2.1.1	Explain the wake turbulence effect and associated hazards to succeeding aircraft.	2		ALL
APS ACFT 2.1.2	Appreciate the techniques used to prevent hazards associated with wake turbulence to succeeding aircraft.	3		ALL
Subtopic ACFT 2.2 — Application of ICAO approach categories				
APS ACFT 2.2.1	Describe the use of ICAO approach categories.	2	ICAO Doc 8168	ADI APP APS
APS ACFT 2.2.2	Appreciate the effect of ICAO approach categories on the organisation of traffic.	3		ADI APP APS

TOPIC ACFT 3 — FACTORS AFFECTING AIRCRAFT PERFORMANCE				
Subtopic ACFT 3.1 — Climb factors				
APS ACFT 3.1.1	Integrate the influence of factors affecting aircraft during climb.	4	*Optional content: speed, mass, air density, cabin pressurisation, wind and temperature*	APP ACP APS ACS
APS ACFT 3.1.2	Describe the influence of factors affecting departing aircraft.	3	*Optional content: runway conditions, runway slope, aerodrome elevation, wind, temperature, aircraft configuration, airframe contamination and aircraft mass*	APP APS
Subtopic ACFT 3.2 — Cruise factors				
APS ACFT 3.2.1	Integrate the influence of factors affecting aircraft during cruise.	4	*Optional content: level, cruising speed, wind, mass, cabin pressurisation*	APP APS

Subtopic ACFT 3.3 — Descent and initial approach factors				
APS ACFT 3.3.1	Integrate the influence of factors affecting aircraft during descent.	4	*Optional content: wind, speed, rate of descent, aircraft configuration, cabin pressurisation*	APP APS
Subtopic ACFT 3.4 — Final approach and landing factors				
APS ACFT 3.4.1	Integrate the influence of factors affecting aircraft during final approach and landing.	4	*Optional content: wind, aircraft configuration, mass, meteorological conditions, runway conditions, runway slope, aerodrome elevation*	APP APS
Subtopic ACFT 3.5 — Economic factors				
APS ACFT 3.5.1	Integrate consideration of economic factors affecting aircraft.	4	*Optional content: routing, level, speed, rate of climb and rate of descent, approach profile*	APP APS
APS ACFT 3.5.2	Provide continuous climb/descent whenever possible.	4		APS *ACS*
APS ACFT 3.5.3	Use direct routing where applicable.	3		APP *ACP* APS *ACS*
APS ACFT 3.5.4	Appreciate controller's actions that may contribute to pilot's ability to fly an optimum continuous descent.	3	*Optional content: level instructions, speed control, vertical speed control, vectoring, distance-to-touchdown information*	APS *ACS*
Subtopic ACFT 3.6 — Environmental factors				
APS ACFT 3.6.1	Appreciate the performance restrictions due to environmental considerations.	3	*Optional content: fuel-dumping, noise-abatement procedures, minimum flight levels, bird strike hazard, continuous descent operations*	APP APS

TOPIC ACFT 4 — AIRCRAFT DATA				
Subtopic ACFT 4.1 — Performance data				
APS ACFT 4.1.1	Integrate the average performance data of a representative sample of aircraft which will be encountered in the operational/ working environment into the provision of control service.	4	Performance data under a representative variety of circumstances	APP ACP APS ACS

SUBJECT 7: HUMAN FACTORS

The subject objective is:

Learners shall recognise the necessity to constantly extend their knowledge and analyse factors which affect personal and team performance.

TOPIC HUM 1 — PSYCHOLOGICAL FACTORS				
Subtopic HUM 1.1 — Cognitive				
APS HUM 1.1.1	Describe the human information-processing model.	2	Attention, perception, memory, situational awareness, decision-making, response	ALL
APS HUM 1.1.2	Describe the factors which influence human information-processing.	2	Confidence, stress, learning, knowledge, experience, fatigue, alcohol/drugs, distraction, interpersonal relations	ALL
APS HUM 1.1.3	Monitor the effect of human information-processing factors on decision-making.	3	*Optional content: workload, stress, interpersonal relations, distraction, confidence*	ALL

TOPIC HUM 2 — MEDICAL AND PHYSIOLOGICAL FACTORS				
Subtopic HUM 2.1 — Fatigue				
APS HUM 2.1.1	State factors that cause fatigue.	1	Shift work *Optional content: night shifts and rosters, , ICAO/IFATCA/CANSO's Fatigue Management Guide for Air Traffic Service Providers*	ALL
APS HUM 2.1.2	Describe the onset of fatigue.	2	*Optional content: lack of concentration, listlessness, irritability, frustration, ICAO/IFATCA/CANSO's Fatigue Management Guide for Air Traffic Service Providers*	ALL
APS HUM 2.1.3	Recognise the onset of fatigue in self.	1	*Optional content: ICAO/IFATCA/CANSO's Fatigue Management Guide for Air Traffic Service Providers*	ALL
APS HUM 2.1.4	Recognise the onset of fatigue in others.	1		ALL
APS HUM 2.1.5	Describe appropriate action when recognising fatigue.	2		ALL
Subtopic HUM 2.2 — Fitness				
APS HUM 2.2.1	Recognise signs of lack of personal fitness.	1		ALL
APS HUM 2.2.2	Describe actions when aware of a lack of personal fitness.	2		ALL

TOPIC HUM 3 — SOCIAL AND ORGANISATIONAL FACTORS				
Subtopic HUM 3.1 — Team resource management (TRM)				
APS HUM 3.1.1	State the relevance of TRM.	1	*Optional content: TRM course, EUROCONTROL Guidelines for the development of TRM training*	ALL
APS HUM 3.1.2	State the content of the TRM concept.	1	*Optional content: teamwork, human error, team roles, stress, decision-making, communication, situational awareness*	ALL
Subtopic HUM 3.2 — Teamwork and team roles				
APS HUM 3.2.1	Identify reasons for conflict.	3		ALL
APS HUM 3.2.2	Describe actions to prevent human conflicts.	2	*Optional content: TRM team roles*	ALL
APS HUM 3.2.3	Describe strategies to cope with human conflicts.	2	*Optional content: in your team, in the simulator*	ALL
Subtopic HUM 3.3 — Responsible behaviour				
APS HUM 3.3.1	Consider the factors which influence responsible behaviour.	2	*Optional content: situation, team, personal situation and judgement, instance of justification, moral motivation, personality*	ALL
APS HUM 3.3.2	Apply responsible judgement.	3	Case study and discussion about a dilemma situation	ALL

TOPIC HUM 4 — STRESS				
Subtopic HUM 4.1 — Stress				
APS HUM 4.1.1	Recognise the effects of stress on performance.	1	Stress and its symptoms in self and in others	ALL
Subtopic HUM 4.2 — Stress management				
APS HUM 4.2.1	Act to reduce stress.	3	The effect of personality in coping with stress, the benefits of active stress management	ALL
APS HUM 4.2.2	Respond to stressful situations by offering, asking or accepting assistance.	3	*Optional content: the benefits of offering, accepting and asking for help in stressful situations*	ALL
APS HUM 4.2.3	Recognise the effect of shocking and stressful events.	1	Self and others, abnormal situations, Critical Incident Stress Management (CISM)	ALL
APS HUM 4.2.4	Consider the benefits of Critical Incident Stress Management (CISM).	2		ALL
APS HUM 4.2.5	Explain procedures to be used following an incident/accident.	2	*Optional content: CISM, counselling, human element*	ALL

TOPIC HUM 5 — HUMAN ERROR				
Subtopic HUM 5.1 — Human error				
APS HUM 5.1.1	Explain the relationship between error and safety.	2	Number and combination of errors, proactive versus reactive approach to discovery of error *Optional content: ICAO Circular 314 — AN/178 Threat and Error Management (TEM) in Air Traffic Control*	ALL
APS HUM 5.1.2	Differentiate between the types of error.	2	Slips, lapses, mistakes *Optional content: ICAO Circular 314 — AN/178 Threat and Error Management (TEM) in Air Traffic Control*	ALL
APS HUM 5.1.3	Describe error-prone conditions.	2	*Optional content: increase in traffic, changes in procedures, complexities of systems or traffic, weather, unusual occurrences*	ALL
APS HUM 5.1.4	Collect examples of different error types, their causes and consequences for ATC.	3	*Optional content: ICAO Circular 314 — AN/178 Threat and Error Management (TEM) in Air Traffic Control*	ALL
APS HUM 5.1.5	Explain how to detect errors to compensate for them.	2	STCA, MSAW, individual and collective strategy *Optional content: ICAO Circular 314 — AN/178 Threat and Error Management (TEM) in Air Traffic Control*	ALL
APS HUM 5.1.6	Execute corrective actions.	3	Error compensation *Optional content: ICAO Circular 314 — AN/178 Threat and Error Management (TEM) in Air Traffic Control*	ALL
APS HUM 5.1.7	Explain the importance of error management.	2	*Optional content: prevention of incidents, safety improvement, revision of procedures and/or working practices*	ALL
APS HUM 5.1.8	Describe the impact on an ATCO's performance following an occurrence/incident.	2	*Optional content: reporting, SMS, investigation, CISM*	ALL
Subtopic HUM 5.2 — Violation of rules				
APS HUM 5.2.1	Explain the causes and dangers of violation of rules becoming accepted as a practice.	2	*Optional content: ICAO Circular 314 — AN/178 Threat and Error Management (TEM) in Air Traffic Control*	ALL

TOPIC HUM 6 — COLLABORATIVE WORK				
Subtopic HUM 6.1 — Communication				
APS HUM 6.1.1	Use communication effectively in ATC.	3		ALL
APS HUM 6.1.2	Analyse examples of pilot–controller communication for effectiveness.	4		ALL
Subtopic HUM 6.2 — Collaborative work within the same area of responsibility				
APS HUM 6.2.1	List communication means between controllers in charge of the same area of responsibility (sector or tower).	1	*Optional content: electronic, written, verbal and non-verbal communication*	ALL
APS HUM 6.2.2	Explain consequences of the use of communication means on effectiveness.	2	*Optional content: strip legibility and encoding, label designation, feedback*	ALL
APS HUM 6.2.3	List possible actions to provide a safe position handover.	1	*Optional content: rigour, preparation, overlap time*	ALL
APS HUM 6.2.4	Explain consequences of a missed position handover process.	2		ALL
Subtopic HUM 6.3 — Collaborative work between different areas of responsibility				
APS HUM 6.3.1	List factors and means for an effective coordination between sectors and/or tower positions.	1	*Optional content: other sectors' constraints, electronic coordination tools*	ALL
Subtopic HUM 6.4 — Controller–pilot cooperation				
APS HUM 6.4.1	Describe parameters affecting controller–pilot cooperation.	2	*Optional content: workload, mutual knowledge, controller versus pilot mental picture*	ALL

SUBJECT 8: EQUIPMENT AND SYSTEMS

The subject objective is:

Learners shall integrate knowledge and understanding of the basic working principles of equipment and systems, and comply with the equipment and system degradation procedures in the provision of ATS.

TOPIC EQPS 1 — VOICE COMMUNICATIONS				
Subtopic EQPS 1.1 — Radio communications				
APS EQPS 1.1.1	Operate two-way communication equipment.	3	Transmit/receive switches, procedures *Optional content: frequency selection, standby equipment*	ALL
APS EQPS 1.1.2	Identify indications of operational status of radio equipment.	3	*Optional content: indicator lights, serviceability displays, selector/frequency displays*	ALL
APS EQPS 1.1.3	Consider radio range.	2	*Optional content: transfer to another frequency, apparent radio failure, failure to establish radio contact, frequency protection range*	APP ACP APS ACS
Subtopic EQPS 1.2 — Other voice communications				
APS EQPS 1.2.1	Operate landline communications.	3	*Optional content: telephone, interphone and intercom equipment*	ALL

TOPIC EQPS 2 — AUTOMATION IN ATS				
Subtopic EQPS 2.1 — Aeronautical fixed telecommunication network (AFTN)				
APS EQPS 2.1.1	Decode AFTN messages.	3	*Optional content: movement and control messages, NOTAMs, SNOWTAMs, BIRDTAMs, etc.*	ALL
Subtopic EQPS 2.2 — Automatic data interchange				
APS EQPS 2.2.1	Use automatic data transfer equipment where available.	3	*Optional content: sequencing systems, automated information and coordination, OLDI*	ADV ADI APS ACS

TOPIC EQPS 3 — CONTROLLER WORKING POSITION				
Subtopic EQPS 3.1 — Operation and monitoring of equipment				
APS EQPS 3.1.1	Monitor the technical integrity of the controller working position.	3	Notification procedures, responsibilities	ALL
APS EQPS 3.1.2	Operate the equipment of the controller working position.	3	*Optional content: situation displays, flight progress board, flight data display, radio, telephone, maps and charts, strip-printer, clock, information systems, UDF/VDF*	ALL
APS EQPS 3.1.3	Operate available equipment in abnormal and emergency situations.	3		ALL

Subtopic EQPS 3.2 — Situation displays and information systems				
APS EQPS 3.2.1	Use situation displays.	3		ALL
APS EQPS 3.2.2	Check availability of information.	3		ALL
APS EQPS 3.2.3	Obtain information from equipment.	3		APP ACP APS ACS
Subtopic EQPS 3.3 — Flight data systems				
APS EQPS 3.3.1	Use the flight data information at controller working position.	3		ALL
Subtopic EQPS 3.4 — Use of ATS surveillance system				
APS EQPS 3.4.1	Use the ATS surveillance system functions.	3		APS ACS
APS EQPS 3.4.2	Analyse the information provided by the ATS surveillance system.	4		APS ACS
APS EQPS 3.4.3	Assign codes.	4		APS ACS
APS EQPS 3.4.4	Appreciate the use of advanced surveillance technology.	3	*Optional content: Mode S, ADS-B, MLAT*	APS ACS
Subtopic EQPS 3.5 — Advanced systems				
APS EQPS 3.5.1	Appreciate the use of controller–pilot data link communications when available.	3		APS ACS
APS EQPS 3.5.2	Appreciate the use of information provided by advanced systems.	3	*Optional content: trajectory-based information, MTCD, MONA, etc.*	APS ACS

TOPIC EQPS 4 — FUTURE EQUIPMENT				
Subtopic EQPS 4.1 — New developments				
APS EQPS 4.1.1	Recognise future developments.	1	New advanced systems	ALL

TOPIC EQPS 5 — EQUIPMENT AND SYSTEMS' LIMITATIONS AND DEGRADATION				
Subtopic EQPS 5.1 — Reaction to limitations				
APS EQPS 5.1.1	Take account of the limitations of equipment and systems.	2		ALL
APS EQPS 5.1.2	Respond to technical deficiencies of the operational position.	3	Notification procedures, responsibilities	ALL

Subtopic EQPS 5.2 — Communication equipment degradation				
APS EQPS 5.2.1	Identify that communication equipment has degraded.	3	*Optional content: ground–air and landline communications*	APP ACP APS ACS
APS EQPS 5.2.2	Apply contingency procedures in the event of communication equipment degradation.	3	*Optional content: procedures for total or partial degradation of ground–air and landline communications, alternative methods of transferring data*	APP ACP APS ACS
Subtopic EQPS 5.3 — Navigational equipment degradation				
APS EQPS 5.3.1	Identify when a navigational equipment failure will affect operational ability.	3	*Optional content: VOR, navigational aids*	ALL
APS EQPS 5.3.2	Apply contingency procedures in the event of a navigational equipment degradation.	3	*Optional content: vertical separation, information to aircraft, navigational assistance, seeking assistance from adjacent units*	ADI APP ACP APS ACS
Subtopic EQPS 5.4 — Surveillance equipment degradation				
APS EQPS 5.4.1	Identify that surveillance equipment has degraded.	3	Partial power failure, loss of certain facilities, total failure	APS ACS
APS EQPS 5.4.2	Apply contingency procedures in the event of surveillance equipment degradation.	3	*Optional content: inform adjacent sectors, inform aircraft, apply vertical separation (emergency), increased horizontal separation, reduce the number of aircraft entering area of responsibility, transfer aircraft to another unit*	APS ACS
Subtopic EQPS 5.5 — ATC processing system degradation				
APS EQPS 5.5.1	Identify a processing system degradation.	3	*Optional content: FDPS, SDPS, software processing of situation display*	APS ACS
APS EQPS 5.5.2	Apply contingency procedures in the event of a processing system degradation.	3		APS ACS

SUBJECT 9: PROFESSIONAL ENVIRONMENT

The subject objective is:

Learners shall identify the need for close cooperation with other parties concerning ATM operations and appreciate aspects of environmental protection.

TOPIC PEN 1 — FAMILIARISATION				
Subtopic PEN 1.1 — Study visit to an approach control unit				
APS PEN 1.1.1	Appreciate the functions and provision of operational approach control service.	3	Study visit to an approach control unit	APP APS

TOPIC PEN 2 — AIRSPACE USERS				
Subtopic PEN 2.1 — Contributors to civil ATS operations				
APS PEN 2.1.1	Characterise civil ATS activities in approach control unit.	2	Study visit to an approach control unit *Optional content: familiarisation visits to TWR, ACC, AIS, RCC*	APP APS
APS PEN 2.1.2	Characterise other parties interfacing with ATS operations.	2	*Optional content: familiarisation visits to engineering services, firefighting and emergency services, airline operations offices*	ALL
Subtopic PEN 2.2 — Contributors to military ATS operations				
APS PEN 2.2.1	Characterise military ATS activities.	2	*Optional content: familiarisation visits to TWR, APP, ACC, AIS, RCC, Air Defence Units*	ALL

TOPIC PEN 3 — CUSTOMER RELATIONS				
Subtopic PEN 3.1 — Provision of services and user requirements				
APS PEN 3.1.1	Identify the role of ATC as a service provider.	3		ALL
APS PEN 3.1.2	Appreciate ATS users' requirements.	3		ALL

TOPIC PEN 4 — ENVIRONMENTAL PROTECTION				
Subtopic PEN 4.1 — Environmental protection				
APS PEN 4.1.1	Describe the environmental constraints on aerodrome operations.	2	*Optional content: ICAO Circular 303 — Operational Opportunities to Minimize Fuel Use and Reduce Emissions*	ADV ADI APP APS
APS PEN 4.1.2	Explain the use of Collaborative Environmental Management (CEM) process at aerodromes.	2		ADV ADI APP APS
APS PEN 4.1.3	Appreciate the mitigation techniques used to minimise aviation's impact on the environment.	3	*Optional content: continuous descent operations (CDO), continuous climb operations (CCO), noise-abatement procedures, noise preferential routes, flight efficiency*	APP APS

SUBJECT 10: ABNORMAL AND EMERGENCY SITUATIONS

The subject objective is:

Learners shall develop a professional attitude to manage traffic in abnormal and emergency situations.

TOPIC ABES 1 — ABNORMAL AND EMERGENCY SITUATIONS (ABES)				
Subtopic ABES 1.1 — Overview of ABES				
APS ABES 1.1.1	List common abnormal and emergency situations.	1	*Optional content: EATM Guidelines for Controller Training in the Handling of Unusual/Emergency Situations, ambulance flights, ground-based safety nets alerts, airframe failure, unreliable instruments, runway incursion*	ALL
APS ABES 1.1.2	Identify potential or actual abnormal and emergency situations.	3		ALL
APS ABES 1.1.3	Take into account the procedures for given abnormal and emergency situations.	2	*Optional content: ICAO Doc 4444*	APP ACP APS ACS
APS ABES 1.1.4	Take into account that procedures do not exist for all abnormal and emergency situations.	2	*Optional content: real-life examples*	ALL
APS ABES 1.1.5	Consider how the evolution of a situation may have an impact on safety.	2	*Optional content: separation, information, coordination*	ALL

TOPIC ABES 2 — SKILLS IMPROVEMENT				
Subtopic ABES 2.1 — Communication effectiveness				
APS ABES 2.1.1	Ensure effective communication in all circumstances including the case where standard phraseology is not applicable.	4	Phraseology, vocabulary, readback, radio silence instruction	ALL
Subtopic ABES 2.2 — Avoidance of mental overload				
APS ABES 2.2.1	Describe actions to keep the situation under control.	2	*Optional content: sector-splitting, holding, flow management, task delegation*	ALL
APS ABES 2.2.2	Organise priority of actions.	4		ALL
APS ABES 2.2.3	Ensure effective dissemination of information.	4	*Optional content: between executive and planner/coordinator, with the supervisor, between sectors, between ACC, APP and TWR, with ground staff, etc.*	ALL
APS ABES 2.2.4	Consider asking for help.	2		ALL

Subtopic ABES 2.3 — Air–ground cooperation				
APS ABES 2.3.1	Collect appropriate information relevant to the situation.	3		ALL
APS ABES 2.3.2	Assist the pilot.	3	Pilot workload *Optional content: instructions, information, support, human factors, etc.*	ALL
TOPIC ABES 3 — PROCEDURES FOR ABNORMAL AND EMERGENCY SITUATIONS (ABES)				
Subtopic ABES 3.1 — Application of procedures for ABES				
APS ABES 3.1.1	Apply the procedures for given abnormal and emergency situations.	3	*Optional content: EATM Guidelines for Controller Training in the Handling of Unusual/Emergency Situations, ambulance flights, ground-based safety nets alerts, airframe failure*	ALL
Subtopic ABES 3.2 — Radio failure				
APS ABES 3.2.1	Describe the procedures to be followed by a pilot when that pilot experiences complete or partial radio failure.	2	*Optional content: ICAO Doc 4444, military procedures*	ALL
APS ABES 3.2.2	Apply the procedures to be followed when a pilot experiences complete or partial radio failure.	3	*Optional content: prolonged loss of communication*	ALL
Subtopic ABES 3.3 — Unlawful interference and aircraft bomb threat				
APS ABES 3.3.1	Apply ATC procedures associated with unlawful interference and aircraft bomb threat.	3		ALL
Subtopic ABES 3.4 — Strayed or unidentified aircraft				
APS ABES 3.4.1	Apply the procedures in the case of strayed aircraft.	3	*Optional content: inside controlled airspace, outside controlled airspace*	ALL
APS ABES 3.4.2	Apply the procedures in the case of unidentified aircraft.	3		ALL
Subtopic ABES 3.5 — Diversions				
APS ABES 3.5.1	Provide navigational assistance to aircraft diverting in emergency.	4	Track/heading, distance, other navigational assistance *Optional content: nearest most suitable aerodrome*	APP ACP APS ACS
Subtopic ABES 3.6 — Transponder failure				
APS ABES 3.6.1	Apply procedures in the event of an SSR transponder failure.	3	*Optional content: total/partial failure, impact on ADS-B/Mode S capability*	APS ACS

SUBJECT 11: AERODROMES

The subject objective is:

Learners shall recognise and understand the design and layout of aerodromes.

TOPIC AGA 1 — AERODROME DATA, LAYOUT AND COORDINATION				
Subtopic AGA 1.1 — Definitions				
APS AGA 1.1.1	Define aerodrome data.	1	*Optional content: aerodrome elevation, reference point, apron, movement area, manoeuvring area, hot spot*	ADV ADI APP APS
Subtopic AGA 1.2 — Coordination				
APS AGA 1.2.1	Identify the information that has to be exchanged between Air Traffic Services (ATS) and the aerodrome authority.	3	Aerodrome conditions, fire/rescue category, condition of ground equipment and NAVAIDs, AIRAC	APP APS ADV ADI

TOPIC AGA 2 — MOVEMENT AREA				
Subtopic AGA 2.1 — Movement area				
APS AGA 2.1.1	Describe movement area.	2		ADV ADI APP APS
APS AGA 2.1.2	Describe the marking of obstacles and unusable or unserviceable areas.	2	Flags, signs on pavement, lights	ADV ADI APP APS
APS AGA 2.1.3	Identify the information on conditions of the movement area that has to be passed on to aircraft.	3	Essential information on aerodrome conditions	ADV ADI APP APS
Subtopic AGA 2.2 — Manoeuvring area				
APS AGA 2.2.1	Describe manoeuvring area.	2		ADV ADI APP APS
APS AGA 2.2.2	Describe taxiway.	2		ADV ADI APP APS
APS AGA 2.2.3	Describe daylight marking on taxiways.	2		ADV ADI APP APS
APS AGA 2.2.4	Describe taxiway lighting.	2		ADV ADI APP APS

Subtopic AGA 2.3 — Runways				
APS AGA 2.3.1	Describe runway.	2	Runway, runway surface, runway strip, shoulder, runway-end safety areas, clearways, stopways	ADV ADI APP APS
APS AGA 2.3.2	Describe instrument runway.	2		ADI APP APS
APS AGA 2.3.3	Describe non-instrument runway.	2		*ADV* ADI APP APS
APS AGA 2.3.4	Explain declared distances.	2	TORA, TODA, ASDA, LDA	*ADV* ADI APP APS
APS AGA 2.3.5	Explain the differences between ACN and PCN.	2	Strength of pavements	*ADV* ADI APP APS
APS AGA 2.3.6	Describe the daylight markings on runways.	2	*Optional content: runway designator, centre line, threshold, aiming point, fixed distance, touchdown zone, side strip, colour*	*ADV* ADI APP APS
APS AGA 2.3.7	Describe runway lights.	2	*Optional content: colour, centre line, intensity, edge, touchdown zone, threshold, barettes*	*ADV* ADI APP APS
APS AGA 2.3.8	Explain the functions of visual landing aids.	2	*Optional content: AVASI, VASI, PAPI*	*ADV* ADI APP APS
APS AGA 2.3.9	Describe the approach lighting systems.	2	Centre line, cross bars, stroboscopic lights, colours, intensity and brightness	*ADV* ADI APP APS
APS AGA 2.3.10	Characterise the effect of water/ice on runways.	2		*ADV* ADI APP APS
APS AGA 2.3.11	Explain braking action.	2	Braking action coefficient	*ADV* ADI APP APS
APS AGA 2.3.12	Explain the effect of runway visual range on aerodrome operation.	2		*ADV* ADI APP APS

TOPIC AGA 3 — OBSTACLES				
Subtopic AGA 3.1 — Obstacle-free airspace around aerodromes				
APS AGA 3.1.1	Explain the necessity for establishing and maintaining an obstacle-free airspace around aerodromes.	2		ADV ADI APP APS

TOPIC AGA 4 — MISCELLANEOUS EQUIPMENT				
Subtopic AGA 4.1 — Location				
APS AGA 4.1.1	Explain the location of different aerodrome ground equipment.	2	Optional content: LOC, GP, VDF, radio communication or ATS surveillance systems sensors, stopbars, AVASI, VASI, PAPI	ADV ADI APP APS

AMC1 ATCO.D.010(a)(2)(vi) Composition of initial training

AREA CONTROL SURVEILLANCE RATING (ACS) TRAINING — SUBJECT OBJECTIVES AND TRAINING OBJECTIVES

(a) The general principles that apply to this AMC are contained in AMC1 ATCO.D.010(a).

(b) The ATCO Rating training Area Control Surveillance Rating (ACS) should contain the following subject objectives and training objectives that are associated with the subjects, topics and subtopics contained in Appendix 8 to TCAR PEL Part ATCO.

(c) Subjects, topics and subtopics from Appendix 8 to TCAR PEL Part ATCO are repeated in this AMC for the convenience of the reader and do not form part of it.

SUBJECT 1: INTRODUCTION TO THE COURSE

The subject objective is:

Learners shall know and understand the training programme that they will follow and learn how to obtain the appropriate information.

TOPIC INTR 1 — COURSE MANAGEMENT				
Subtopic INTR 1.1 — Course introduction				
ACS INTR 1.1.1	Explain the aims and main objectives of the course.	2		ALL
Subtopic INTR 1.2 — Course administration				
ACS INTR 1.2.1	State how the course is administered.	1		ALL
Subtopic INTR 1.3 — Study material and training documentation				
ACS INTR 1.3.1	Use appropriate documents and their sources for course studies.	3	*Optional content: training documentation, library, CBT library, web, learning management server*	ALL
ACS INTR 1.3.2	Integrate appropriate information into course studies.	4	Training documentation *Optional content: supplementary information, library*	ALL

TOPIC INTR 2 — INTRODUCTION TO THE ATC TRAINING COURSE				
Subtopic INTR 2.1 — Course content and organisation				
ACS INTR 2.1.1	State the different training methods used during the course.	1	Theoretical training, practical training, self-study, types of training events	ALL
ACS INTR 2.1.2	State the subjects covered by the course and their purpose.	1		ALL
ACS INTR 2.1.3	Describe the organisation of theoretical training.	2	*Optional content: course programme*	ALL
ACS INTR 2.1.4	Describe the organisation of practical training.	2	*Optional content: PTP, simulation, briefing, debriefing, course programme*	ALL

Subtopic INTR 2.2 — Training ethos				
ACS INTR 2.2.1	Recognise the feedback mechanisms available.	1	Training progress, assessment, briefing, debriefing, learner–instructor feedback, instructor–instructor feedback	ALL
Subtopic INTR 2.3 — Assessment process				
ACS INTR 2.3.1	Describe the assessment process.	2		ALL

SUBJECT 2: AVIATION LAW

The subject objective is:

Learners shall know, understand and apply the Rules of the Air and the Regulations regarding reporting and airspace, and appreciate the Licensing and Competence principles.

TOPIC LAW 1 — ATCO LICENSING/CERTIFICATE OF COMPETENCE				
Subtopic LAW 1.1 — Privileges and conditions				
ACS LAW 1.1.1	Appreciate the conditions which shall be met to issue an Area Control Surveillance rating.	3	Relevant national regulation on ATCO Licensing *Optional content: national documents*	ACS
ACS LAW 1.1.2	Explain how to maintain and update professional knowledge and skills to retain competence in the operational environment.	2		ALL
ACS LAW 1.1.3	Explain the conditions for suspension/ revocation of an ATCO licence.	2	Relevant national regulation on ATCO Licensing	ALL

TOPIC LAW 2 — RULES AND REGULATIONS				
Subtopic LAW 2.1 — Reports				
ACS LAW 2.1.1	List the standard forms for reports.	1	Air traffic incident report Optional content: routine air-reports, breach of regulations, watchbook/logbook, records	ALL
ACS LAW 2.1.2	Describe the functions of, and processes for, reporting.	2	Reporting culture, air traffic incident report *Optional content: breach of regulations, watchbook/logbook, records, voluntary reporting*	ALL
ACS LAW 2.1.3	Use forms for reporting.	3	air traffic incident reporting form(s) *Optional content: routine air-reports, breach of regulations, watchbook/logbook, records*	ALL
Subtopic LAW 2.2 — Airspace				
ACS LAW 2.2.1	Appreciate airspace classes and structure and their relevance to operations using the Area Control Surveillance rating.	3		ACS
ACS LAW 2.2.2	Provide planning, coordination and control actions appropriate to the classification and structure of airspace.	4	*Optional content: international requirements, civil requirements, military requirements, areas of responsibility, sectorisation, national requirements*	ALL
ACS LAW 2.2.3	Appreciate responsibility for terrain clearance.	3		ALL

TOPIC LAW 3 — ATC SAFETY MANAGEMENT				
Subtopic LAW 3.1 — Feedback process				
ACS LAW 3.1.1	State the importance of controller contribution to the feedback process.	1	*Optional content: voluntary reporting*	ALL
ACS LAW 3.1.2	Describe how reported occurrences are analysed.	2	Relevant national regulations *Optional content: local procedures*	ALL
ACS LAW 3.1.3	Name the means used to disseminate recommendations.	1	*Optional content: safety letters, safety boards web pages*	ALL
ACS LAW 3.1.4	Appreciate the 'Just Culture' concept.	3	Benefits, prerequisites, constraints *Optional content:* *https://www.skybrary.aero*	ALL
Subtopic LAW 3.2 — Safety Investigation				
ACS LAW 3.2.1	Describe role and mission of Safety Investigation in the improvement of safety.	2		ALL
ACS LAW 3.2.2	Define working methods of Safety Investigation.	1		ALL

SUBJECT 3: AIR TRAFFIC MANAGEMENT

The subject objective is:

Learners shall manage air traffic to ensure safe, orderly and expeditious services.

TOPIC ATM 1 — PROVISION OF SERVICES				
Subtopic ATM 1.1 — Air traffic control (ATC) service				
ACS ATM 1.1.1	Appreciate own area of responsibility.	3		APP ACP APS ACS
ACS ATM 1.1.2	Provide area control service.	4	ICAO Annex 11, ICAO Doc 7030, ICAO Doc 4444, operation manuals	ACP ACS
Subtopic ATM 1.2 — Flight information service (FIS)				
ACS ATM 1.2.1	Provide FIS.	4	ICAO Doc 4444, *Optional content: national documents*	*ALL*
ACS ATM 1.2.2	Use an ATS surveillance system in the provision of FIS.	3	ICAO Doc 4444, information to identified aircraft concerning: traffic, navigation *Optional content: weather*	APS ACS
ACS ATM 1.2.3	Issue appropriate information concerning the position of conflicting traffic.	3	ICAO Doc 4444, traffic information, essential traffic information	APS ACS *APP* *ACP*
Subtopic ATM 1.3 — Alerting service (ALRS)				
ACS ATM 1.3.1	Provide ALRS.	4	ICAO Doc 4444, *Optional content: national documents*	ALL
ACS ATM 1.3.2	Respond to distress and urgency messages and signals.	3	ICAO Annex 10, ICAO Doc 4444 *Optional content: EUROCONTROL Guidelines for Controller Training in the Handling of Unusual/Emergency Situations*	ALL
ACS ATM 1.3.3	Use an ATS surveillance system in the provision of ALRS.	3		APS ACS
Subtopic ATM 1.4 — ATS system capacity and air traffic flow management				
ACS ATM 1.4.1	Appreciate the impact of ATS system capacity and air traffic flow management on the controller.	3	*Optional content: EUROCONTROL ATFCM Users Manual, FABs, FUA, free route airspace, local implementation of ATFCM principles, etc.*	APP ACP APS ACS
ACS ATM 1.4.2	Apply flow management procedures in the provision of ATC.	3	*Optional content: EUROCONTROL ATFCM Users Manual*	APP ACP APS ACS

ACS ATM 1.4.3	Organise traffic flows and patterns to take account of airspace boundaries.	4	*Optional content: civil and military, controlled, uncontrolled, advisory, restricted, danger, prohibited, special rules, sector boundaries, national boundaries, FIR boundaries, delegated airspace, transfer of control, transfer of communications, en-route, off-route*	APP ACP APS ACS
ACS ATM 1.4.4	Organise traffic flows and patterns to take account of areas of responsibility.	4	*Optional content: EUROCONTROL ATFCM Users Manual*	APP ACP APS ACS
ACS ATM 1.4.5	Inform supervisor of local factors affecting ATS system capacity and air traffic flow management.	3	*Optional content: abnormal situations, decrease in sector capacity, limitations on systems and equipment, changes in workload/capacity, unusual meteorological conditions, relevant information like: reported ground-based incidents, forest fire, smoke, oil pollution*	APP ACP APS ACS
ACS ATM 1.4.6	Organise traffic flows and patterns to take account of ATS surveillance system capability.	4		APS ACS
Subtopic ATM 1.5 — Airspace management (ASM)				
ACS ATM 1.5.1	Appreciate the impact of ASM on the controller.	3	*Optional content: FABs, EUROCONTROL Specification for the application of FUA, TSAs, CDRs, CBAs, free route airspace*	APP ACP APS ACS
ACS ATM 1.5.2	Organise traffic to take account of ASM.	4	Real-time activation, deactivation or reallocation of airspace *Optional content: CDR, TSA, TRA, CBA*	*APS* ACS
TOPIC ATM 2 — COMMUNICATION				
Subtopic ATM 2.1 — Effective communication				
ACS ATM 2.1.1	Use approved phraseology.	3	ICAO Doc 4444 and ICAO Doc 9432	ALL
ACS ATM 2.1.2	Ensure effective communication.	4	Communication techniques, readback/verification of readback	ALL
TOPIC ATM 3 — ATC CLEARANCES AND ATC INSTRUCTIONS				
Subtopic ATM 3.1 — ATC clearances				
ACS ATM 3.1.1	Issue appropriate ATC clearances.	3	*Optional content: ICAO Doc 4444, national documents*	ALL
ACS ATM 3.1.2	Integrate appropriate ATC clearances in control service.	4		ALL
ACS ATM 3.1.3	Ensure the agreed course of action is carried out.	4		ALL

Subtopic ATM 3.2 — ATC instructions				
ACS ATM 3.2.1	Issue appropriate ATC instructions.	3	ICAO Doc 4444 *Optional content: national documents*	ALL
ACS ATM 3.2.2	Integrate appropriate ATC instructions in control service.	4		ALL
ACS ATM 3.2.3	Ensure the agreed course of action is carried out.	4		ALL

TOPIC ATM 4 — COORDINATION				
Subtopic ATM 4.1 — Necessity for coordination				
ACS ATM 4.1.1	Identify the need for coordination.	3		ALL
Subtopic ATM 4.2 — Tools and methods for coordination				
ACS ATM 4.2.1	Use the available tools for coordination.	3	*Optional content: electronic transfer of flight data, telephone, interphone, intercom, direct speech, radiotelephone (RTF), local agreements, automated system coordination*	ALL
Subtopic ATM 4.3 — Coordination procedures				
ACS ATM 4.3.1	Initiate appropriate coordination.	3	Delegation/transfer of responsibility for air–ground communications and separation, transfer of control, etc., ICAO Doc 4444 *Optional content: release point*	ALL
ACS ATM 4.3.2	Analyse effect of coordination requested by an adjacent position/unit.	4	*Optional content: delegation/transfer of responsibility for air–ground communications and separation, release point, transfer of control, etc.*	ALL
ACS ATM 4.3.3	Select, after negotiation, an appropriate course of action.	5		ALL
ACS ATM 4.3.4	Ensure the agreed course of action is carried out.	4		ALL
ACS ATM 4.3.5	Coordinate when providing FIS.	4	ICAO Doc 4444	ALL
ACS ATM 4.3.6	Coordinate when providing ALRS.	4	ICAO Doc 4444	ALL

TOPIC ATM 5 — ALTIMETRY AND LEVEL ALLOCATION				
Subtopic ATM 5.1 — Altimetry				
ACS ATM 5.1.1	Allocate levels according to altimetry data.	4		ALL
ACS ATM 5.1.2	Ensure separation according to altimetry data.	4	*Optional content: transition level, transition altitude, transition layer, height, flight level, altitude, vertical distance to airspace boundaries*	ALL
Subtopic ATM 5.2 — Terrain clearance				
ACS ATM 5.2.1	Provide planning, coordination and control actions appropriate to the rules for minimum safe levels and terrain clearance.	4	*Optional content: minimum vectoring altitude, terrain clearance dimensions, minimum safe altitudes, transition level, minimum flight level, minimum sector altitude*	APS ACS

TOPIC ATM 6 — SEPARATIONS				
Subtopic ATM 6.1 — Vertical separation				
ACS ATM 6.1.1	Provide standard vertical separation.	4	*ICAO Doc 4444, level allocation, during climb/descent, rate of climb/descent, RVSM, non-RVSM aircraft, holding pattern*	ACP ACS
ACS ATM 6.1.2	Provide increased vertical separation.	4	ICAO Doc 4444, *Optional content: level allocation, during climb/descent, rate of climb/descent, degraded aircraft performance, non-RVSM aircraft, reported severe turbulence*	APP ACP APS ACS
ACS ATM 6.1.3	Appreciate the application of emergency vertical separation.	3	ICAO Doc 4444, ICAO Doc 7030	APP ACP APS ACS
ACS ATM 6.1.4	Provide vertical separation in a surveillance environment.	4	Pressure altitude-derived information, pilot-level reports *Optional content: into/out of ATS surveillance system coverage*	APS ACS
Subtopic ATM 6.2 — Longitudinal separation in a surveillance environment				
ACS ATM 6.2.1	Provide longitudinal separation in a surveillance environment.	4	Successive departures, successive arrivals, overflights, speed control, Mach number techniques, silent transfer, ICAO Doc 4444	ACS
Subtopic ATM 6.3 — Wake turbulence distance-based separation				
ACS ATM 6.3.1	Provide distance-based wake turbulence separation.	4	ICAO Doc 4444, *Optional content: EASA SIB 2017-10 'En-route Wake Turbulence Encounters', national documents*	APS ACS
Subtopic ATM 6.4 — Separation based on ATS surveillance systems				
ACS ATM 6.4.1	Describe how separation based on ATS surveillance systems is applied.	2	ICAO Doc 4444	APS ACS
ACS ATM 6.4.2	Provide horizontal separation.	4	ICAO Doc 4444, ICAO Doc 7030, local operation manuals, holding	APS ACS

ACS ATM 6.4.3	Provide horizontal separation by vectoring in a variety of situations.	4	*Optional content: transit, meteorological phenomena, vectoring for approach, departure versus transit versus arrival*	APS ACS
ACS ATM 6.4.4	Ensure horizontal or vertical separation from airspace boundaries.	4	Adjacent sectors, restricted, prohibited and danger areas, TSAs.	APS ACS

TOPIC ATM 7 — AIRBORNE COLLISION AVOIDANCE SYSTEMS AND GROUND-BASED SAFETY NETS				
Subtopic ATM 7.1 — Airborne collision avoidance systems				
ACS ATM 7.1.1	Differentiate between ACAS advisory thresholds and separation standards applicable in the area control environment.	2	ICAO Doc 9863	ACP ACS
ACS ATM 7.1.2	Describe the controller responsibility during and following an ACAS RA reported by pilot.	2	ICAO Doc 4444	ALL
ACS ATM 7.1.3	Respond to pilot notification of actions based on airborne systems warnings.	3	ACAS, TAWS	ALL
Subtopic ATM 7.2 — Ground-based safety nets				
ACS ATM 7.2.1	Describe the controller responsibility during and following safety net warnings.	2	ICAO Doc 4444 *Optional content: STCA, MSAW, APW, APM*	APS ACS
ACS ATM 7.2.2	Respond to ground-based safety net warnings.	3	*Optional content: STCA, MSAW, APW, APM*	APS ACS

TOPIC ATM 8 — DATA DISPLAY				
Subtopic ATM 8.1 — Data management				
ACS ATM 8.1.1	Update the data display to accurately reflect the traffic situation.	3	*Optional content: information displayed, strip-marking procedures, electronic information data displays, actions based on traffic display information, calculation of EETs*	ALL
ACS ATM 8.1.2	Analyse pertinent data on data displays.	4		ALL
ACS ATM 8.1.3	Organise pertinent data on data displays.	4		ALL
ACS ATM 8.1.4	Obtain flight plan information.	3	CPL, FPL, supplementary information Optional content: RPL, AFIL, etc.	ALL
ACS ATM 8.1.5	Use flight plan information.	3		ALL

TOPIC ATM 9 — OPERATIONAL ENVIRONMENT (SIMULATED)				
Subtopic ATM 9.1 — Integrity of the operational environment				
ACS ATM 9.1.1	Obtain information concerning the operational environment.	3	*Optional content: briefing, notices, local orders, verification of information*	ALL
ACS ATM 9.1.2	Ensure the integrity of the operational environment.	4	*Optional content: integrity of displays, verification of the information provided by displays, etc.*	APP ACP APS ACS
Subtopic ATM 9.2 — Verification of the currency of operational procedures				
ACS ATM 9.2.1	Check all relevant documentation before managing traffic.	3	*Optional content: briefing, letters of agreement (LoAs), NOTAMs, AICs*	ALL
ACS ATM 9.2.2	Manage traffic in accordance with a change to operational procedures.	4		APP ACP APS ACS
Subtopic ATM 9.3 — Handover–takeover				
ACS ATM 9.3.1	Transfer information to the relieving controller.	3		ALL
ACS ATM 9.3.2	Obtain information from the controller handing over.	3		ALL

TOPIC ATM 10 — PROVISION OF CONTROL SERVICE				
Subtopic ATM 10.1 — Responsibility and processing of information				
ACS ATM 10.1.1	Describe the division of responsibility among air traffic control units.	2	ICAO Doc 4444	*ALL*
ACS ATM 10.1.2	Describe the responsibility in regard to military traffic.	2	ICAO Doc 4444 *Optional content: ICAO Doc 9554*	*ALL*
ACS ATM 10.1.3	Describe the responsibility in regard to unmanned free balloons.	2		APP ACP APS ACS
ACS ATM 10.1.4	Obtain operational information.	3	ICAO Doc 4444, local operation manuals	APP ACP APS ACS
ACS ATM 10.1.5	Interpret operational information.	5		APP ACP APS ACS
ACS ATM 10.1.6	Organise forwarding of operational information.	4	*Optional content: including the use of backup procedures*	APP ACP APS ACS

ACS ATM 10.1.7	Integrate operational information into control decisions.	4		APP ACP APS ACS
ACS ATM 10.1.8	Appreciate the influence of operational requirements.	3	*Optional content: military flying, calibration flights, aerial photography*	*ALL*
Subtopic ATM 10.2 — ATS surveillance service				
ACS ATM 10.2.1	Explain the responsibility for the provision of ATS surveillance service appropriate to ACS rating.	2	ICAO Doc 4444, ICAO Annex 11, local operation manuals	ACS
ACS ATM 10.2.2	Explain the functions that may be performed with the use of ATS surveillance system derived information presented on a situation display.	2	ICAO Doc 4444	APS ACS
ACS ATM 10.2.3	Provide planning, coordination and control actions appropriate to VFR and IFR traffic in VMC and IMC.	4	ICAO Annex 11, ICAO Doc 4444	ACS *APP ACP APS*
ACS ATM 10.2.4	Apply the procedures for termination of ATS surveillance service.	3	ICAO Doc 4444 *Optional content: transfer of control, termination or interruption of ATS surveillance service*	APS ACS
Subtopic ATM 10.3 — Traffic management process				
ACS ATM 10.3.1	Ensure that situational awareness is maintained.	4	Information gathering, scanning, traffic projection	APS ACS
ACS ATM 10.3.2	Detect conflicts in time for appropriate resolution.	4		ALL
ACS ATM 10.3.3	Identify potential solutions to achieve a safe and effective traffic flow.	3		APP ACP APS ACS
ACS ATM 10.3.4	Evaluate possible outcomes of different planning and control actions.	5		APP ACP APS ACS
ACS ATM 10.3.5	Select an appropriate plan in time to achieve safe and effective traffic flow.	5		APP ACP APS ACS
ACS ATM 10.3.6	Ensure an adequate priority of actions.	4		ALL
ACS ATM 10.3.7	Execute selected plan in a timely manner.	3		APP ACP APS ACS
ACS ATM 10.3.8	Ensure a safe and efficient outcome is achieved.	4	Traffic monitoring, adaptability and follow-up	ALL

Subtopic ATM 10.4 — Handling traffic				
ACS ATM 10.4.1	Manage arrivals, departures and overflights.	4		APP ACP APS ACS
ACS ATM 10.4.2	Balance the workload against personal capacity.	5	*Optional content: rerouting, replanning, prioritising solutions, denying requests, delegating responsibility for separation*	APP ACP APS ACS
ACS ATM 10.4.3	Define flight path monitoring and vectoring.	1	ICAO Doc 4444	APS ACS
ACS ATM 10.4.4	Explain the requirements for vectoring and termination of vectoring.	2	ICAO Doc 4444	APS ACS
ACS ATM 10.4.5	Provide vectoring.	4	ICAO Doc 4444, *Optional content: separation, expediting arrivals, departures and/or climb to cruising levels, aircraft leaving the hold, navigation assistance, uncontrolled airspace, etc.*	APS ACS
ACS ATM 10.4.6	Apply the procedures for termination of vectoring.	3	ICAO Doc 4444,	APS ACS
Subtopic ATM 10.5 — Control service with advanced system support				
ACS ATM 10.5.1	Appreciate the impact of advanced systems on the provision of area control service.	3	*Optional content: sequencing systems, automated holding lists, vertical traffic displays, conflict detection and decision-making tools, automated information and coordination tools*	ACS

TOPIC ATM 11 — HOLDING				
Subtopic ATM 11.1 — General holding procedures				
ACS ATM 11.1.1	Apply holding procedures.	3	ICAO Doc 4444, holding instructions, allocation of holding levels, onward clearance times	APP ACP APS ACS
ACS ATM 11.1.2	Appreciate the factors affecting holding patterns.	3	Effect of speed, effect of level used, effect of navigation aid in use, turbulence, aircraft type	APP ACP APS ACS
Subtopic ATM 11.2 — Holding aircraft				
ACS ATM 11.2.1	Issue expected onward clearance times.	3		ACP ACS
Subtopic ATM 11.3 — Holding in a surveillance environment				
ACS ATM 11.3.1	Organise traffic to separate other aircraft from holding aircraft.	4		APS ACS
ACS ATM 11.3.2	Integrate system support, when available.	4	*Optional content: arrival management system, automated holding lists, vertical traffic displays*	APS ACS

TOPIC ATM 12 — IDENTIFICATION				
Subtopic ATM 12.1 — Establishment of identification				
ACS ATM 12.1.1	Appreciate the precautions when establishing identification.	3		APS ACS
ACS ATM 12.1.2	Identify aircraft.	3	*Optional content: PSR, SSR or ADS identification method*	APS ACS
ACS ATM 12.1.3	Apply the procedures in the case of misidentification.	3		APS ACS
Subtopic ATM 12.2 — Maintenance of identification				
ACS ATM 12.2.1	Appreciate the necessity to maintain identification.	3		APS ACS
Subtopic ATM 12.3 — Loss of identity				
ACS ATM 12.3.1	Appreciate when an aircraft identification is lost or in doubt.	3	*Optional content: out of ATS surveillance system coverage, failure of ATS surveillance system, weather clutter, other clutter, garbling, holding, etc.*	APS ACS
ACS ATM 12.3.2	Apply methods to re-establish identification.	3		APS ACS
ACS ATM 12.3.3	Respond to loss/doubt concerning identification.	3	*Optional content: procedural separation*	APS ACS
Subtopic ATM 12.4 — Position information				
ACS ATM 12.4.1	Appreciate the circumstances when position information should be passed on to aircraft.	3		APS ACS
ACS ATM 12.4.2	State the format in which position information can be passed on to aircraft.	1	ICAO Doc 4444	APS ACS
Subtopic ATM 12.5 — Transfer of identity				
ACS ATM 12.5.1	Apply the methods of transfer of identification.	3		APS ACS
ACS ATM 12.5.2	Appreciate the precautions when transferring identification.	3		APS ACS

SUBJECT 4: METEOROLOGY

The subject objective is:

Learners shall acquire, decode and make proper use of meteorological information relevant to the provision of ATS.

TOPIC MET 1 — METEOROLOGICAL PHENOMENA				
Subtopic MET 1.1 — Meteorological phenomena				
ACS MET 1.1.1	Appreciate the impact of adverse weather on aircraft.	3	Thunderstorms, icing, jet streams, clear-air turbulence (CAT), turbulence, microburst, severe mountain waves, squall lines, volcanic ash *Optional content: solar radiation*	ACP ACS
ACS MET 1.1.2	Integrate data about meteorological phenomena into the provision of ATS.	4	Clearances, instructions and transmitted information *Optional content: relevant meteorological phenomena*	*ALL*
ACS MET 1.1.3	Use techniques to avoid adverse weather when necessary/possible.	3	Rerouting, level change, etc.	APP ACP APS ACS

TOPIC MET 2 — SOURCES OF METEOROLOGICAL DATA				
Subtopic MET 2.1 — Sources of meteorological information				
ACS MET 2.1.1	Obtain meteorological information	3	METAR, TAF, SIGMET, AIRMET *Optional content: AIREP/special AIREP*	APP ACP APS ACS
ACS MET 2.1.2	Relay meteorological information.	3	ICAO Doc 4444, *Optional content: flight information centre, adjacent ATS unit*	*ALL*

SUBJECT 5: NAVIGATION

The subject objective is:

Learners shall analyse all navigational aspects in order to organise the traffic.

TOPIC NAV 1 — MAPS AND AERONAUTICAL CHARTS				
Subtopic NAV 1.1 — Maps and charts				
ACS NAV 1.1.1	Use relevant maps and charts.	3		*APP* ACP *APS* ACS

TOPIC NAV 2 — INSTRUMENT NAVIGATION				
Subtopic NAV 2.1 — Navigational systems				
ACS NAV 2.1.1	Manage traffic in case of change in the operational status of navigational systems.	4	*Optional content: limitations, availability and status of ground-based and satellite-based systems*	APP ACP APS ACS
ACS NAV 2.1.2	Appreciate the effect of a change in the operational status of navigational systems.	3	*Optional content: precision, limitations, status, degraded procedures*	*ALL*
Subtopic NAV 2.2 — Navigational assistance				
ACS NAV 2.2.1	Evaluate the necessary information to be provided to pilots in need of navigational assistance.	5	*Optional content: nearest most suitable aerodrome, track, heading, distance, aerodrome information, any other navigational assistance relevant at the time*	*APP* ACP *APS* ACS
ACS NAV 2.2.2	Assist pilots with navigation when required.	3	Aircraft observed to be deviating from their known intended route, on pilots' request	*APS* ACS
Subtopic NAV 2.3 — PBN applications				
ACS NAV 2.3.1	State the navigation applications used in terminal and en-route environments.	1	Terminal-RNAV-1 (≈P-RNAV), En-route-RNAV-5 (B-RNAV) *Optional content: A-RNP, ICAO Doc 9613*	ACP ACS
ACS NAV 2.3.2	Explain the principles and designation of navigation specifications in use.	2	*Optional content: performance, functionality, sensors, aircrew and controller requirements*	*APP* ACP *APS* ACS
ACS NAV 2.3.3	State future PBN developments.	1	A-RNP, RNP (AR) DEP *Optional content: RNP 3D, VNAV, 4D, TBO*	*ADI APP* ACP *APS* ACS

SUBJECT 6: AIRCRAFT

The subject objective is:

Learners shall assess and integrate aircraft performance in the provision of ATS.

TOPIC ACFT 1 — AIRCRAFT INSTRUMENTS				
Subtopic ACFT 1.1 — Aircraft instruments				
ACS ACFT 1.1.1	Integrate information from aircraft instruments provided by the pilot in the provision of ATS.	4		ALL
ACS ACFT 1.1.2	Explain the operation of aircraft radio equipment.	2	*Optional content: radios (number of), emergency radios*	ALL
ACS ACFT 1.1.3	Explain the operation of on-board surveillance equipment.	2	Transponders: equipment Mode A, Mode C, Mode S, ADS capability	ADI APS ACS

TOPIC ACFT 2 — AIRCRAFT CATEGORIES				
Subtopic ACFT 2.1 — Wake turbulence				
ACS ACFT 2.1.1	Explain the wake turbulence effect and associated hazards to succeeding aircraft.	2		ALL
ACS ACFT 2.1.2	Appreciate the techniques used to prevent hazards associated with wake turbulence to succeeding aircraft.	3		ALL

TOPIC ACFT 3 — FACTORS AFFECTING AIRCRAFT PERFORMANCE				
Subtopic ACFT 3.1 — Climb factors				
ACS ACFT 3.1.1	Integrate the influence of factors affecting aircraft during climb.	4	*Optional content: speed, mass, air density, cabin pressurisation, wind and temperature*	APP ACP APS ACS
Subtopic ACFT 3.2 — Cruise factors				
ACS ACFT 3.2.1	Integrate the influence of factors affecting aircraft during cruise.	4	Level, cruising speed, wind, mass, cabin pressurisation	ACP ACS
Subtopic ACFT 3.3 — Descent factors				
ACS ACFT 3.3.1	Integrate the influence of factors affecting aircraft during descent.	4	*Optional content: wind, speed, rate of descent, cabin pressurisation*	ACP ACS
Subtopic ACFT 3.4 — Economic factors				
ACS ACFT 3.4.1	Integrate consideration of economic factors affecting aircraft.	4	*Optional content: routing, level, speed, rate of climb and rate of descent, approach profile, top of descent*	ACP ACS
ACS ACFT 3.4.2	Provide continuous climb/descent whenever possible.	4		*APS* ACS

ACS ACFT 3.4.3	Use direct routing where applicable.	3		*APP* ACP *APS* ACS
ACS ACFT 3.4.4	Appreciate controller's actions that may contribute to pilot's ability to fly an optimum continuous descent.	3		ACS *APS*
Subtopic ACFT 3.5 — Environmental factors				
ACS ACFT 3.5.1	Appreciate the performance restrictions due to environmental considerations.	3	*Optional content: fuel-dumping, minimum flight levels, continuous descent operations*	ACP ACS

TOPIC ACFT 4 — AIRCRAFT DATA				
Subtopic ACFT 4.1 — Performance data				
ACS ACFT 4.1.1	Integrate the average performance data of a representative sample of aircraft which will be encountered in the operational/ working environment into the provision of control service.	4	Performance data under a representative variety of circumstances	APP ACP APS ACS

SUBJECT 7: HUMAN FACTORS

The subject objective is:

Learners shall recognise the necessity to constantly extend their knowledge and analyse factors which affect personal and team performance.

TOPIC HUM 1 — PSYCHOLOGICAL FACTORS				
Subtopic HUM 1.1 — Cognitive				
ACS HUM 1.1.1	Describe the human information-processing model.	2	Attention, perception, memory, situational awareness, decision-making, response	ALL
ACS HUM 1.1.2	Describe the factors which influence human information-processing.	2	Confidence, stress, learning, knowledge, experience, fatigue, alcohol/drugs, distraction, interpersonal relations	ALL
ACS HUM 1.1.3	Monitor the effect of human information-processing factors on decision-making.	3	*Optional content: workload, stress, interpersonal relations, distraction, confidence*	ALL

TOPIC HUM 2 — MEDICAL AND PHYSIOLOGICAL FACTORS				
Subtopic HUM 2.1 — Fatigue				
ACS HUM 2.1.1	State factors that cause fatigue.	1	Shift work *Optional content: night shifts and rosters, ICAO/IFATCA/CANSO's Fatigue Management Guide for Air Traffic Service Providers*	ALL
ACS HUM 2.1.2	Describe the onset of fatigue.	2	*Optional content: lack of concentration, listlessness, irritability, frustration, ICAO/IFATCA/CANSO's Fatigue Management Guide for Air Traffic Service Providers*	ALL
ACS HUM 2.1.3	Recognise the onset of fatigue in self.	1	*Optional content: ICAO/IFATCA/CANSO's Fatigue Management Guide for Air Traffic Service Providers*	ALL
ACS HUM 2.1.4	Recognise the onset of fatigue in others.	1		ALL
ACS HUM 2.1.5	Describe appropriate action when recognising fatigue.	2		ALL
Subtopic HUM 2.2 — Fitness				
ACS HUM 2.2.1	Recognise signs of lack of personal fitness.	1		ALL
ACS HUM 2.2.2	Describe actions when aware of a lack of personal fitness.	2		ALL

TOPIC HUM 3 — SOCIAL AND ORGANISATIONAL FACTORS				
Subtopic HUM 3.1 — Team resource management (TRM)				
ACS HUM 3.1.1	State the relevance of TRM.	1	*Optional content: TRM course, EUROCONTROL Guidelines for the development of TRM training*	ALL
ACS HUM 3.1.2	State the content of the TRM concept.	1	*Optional content: teamwork, human error, team roles, stress, decision-making, communication, situational awareness*	ALL
Subtopic HUM 3.2 — Teamwork and team roles				
ACS HUM 3.2.1	Identify reasons for conflict.	3		ALL
ACS HUM 3.2.2	Describe actions to prevent human conflicts.	2	*Optional content: TRM team roles*	ALL
ACS HUM 3.2.3	Describe strategies to cope with human conflicts.	2	*Optional content: in your team, in the simulator*	ALL
Subtopic HUM 3.3 — Responsible behaviour				
ACS HUM 3.3.1	Consider the factors which influence responsible behaviour.	2	*Optional content: situation, team, personal situation and judgement, instance of justification, moral motivation, personality*	ALL
ACS HUM 3.3.2	Apply responsible judgement.	3	Case study and discussion about a dilemma situation	ALL

TOPIC HUM 4 — STRESS				
Subtopic HUM 4.1 — Stress				
ACS HUM 4.1.1	Recognise the effects of stress on performance.	1	Stress and its symptoms in self and in others	ALL
Subtopic HUM 4.2 — Stress management				
ACS HUM 4.2.1	Act to reduce stress.	3	The effect of personality in coping with stress, the benefits of active stress management	ALL
ACS HUM 4.2.2	Respond to stressful situations by offering, asking or accepting assistance.	3	*Optional content: the benefits of offering, accepting and asking for help in stressful situations*	ALL
ACS HUM 4.2.3	Recognise the effect of shocking and stressful events.	1	Self and others, abnormal situations, Critical Incident Stress Management (CISM)	ALL
ACS HUM 4.2.4	Consider the benefits of Critical Incident Stress Management (CISM).	2		ALL
ACS HUM 4.2.5	Explain procedures to be used following an incident/accident.	2	*Optional content: CISM, counselling, human element*	ALL

TOPIC HUM 5 — HUMAN ERROR				
Subtopic HUM 5.1 — Human error				
ACS HUM 5.1.1	Explain the relationship between error and safety.	2	Number and combination of errors, proactive versus reactive approach to discovery of error *Optional content: ICAO Circular 314 — AN/178 Threat and Error Management (TEM) in Air Traffic Control*	ALL
ACS HUM 5.1.2	Differentiate between the types of error.	2	Slips, lapses, mistakes *Optional content: ICAO Circular 314 — AN/178 Threat and Error Management (TEM) in Air Traffic Control*	ALL
ACS HUM 5.1.3	Describe error-prone conditions.	2	*Optional content: increase in traffic, changes in procedures, complexities of systems or traffic, weather, unusual occurrences*	ALL
ACS HUM 5.1.4	Collect examples of different error types, their causes and consequences for ATC.	3	*Optional content: ICAO Circular 314 — AN/178 Threat and Error Management (TEM) in Air Traffic Control*	ALL
ACS HUM 5.1.5	Explain how to detect errors to compensate for them.	2	STCA, MSAW, individual and collective strategy *Optional content: ICAO Circular 314 — AN/178 Threat and Error Management (TEM) in Air Traffic Control*	ALL
ACS HUM 5.1.6	Execute corrective actions.	3	Error compensation *Optional content: ICAO Circular 314 — AN/178 Threat and Error Management (TEM) in Air Traffic Control*	ALL
ACS HUM 5.1.7	Explain the importance of error management.	2	*Optional content: prevention of incidents, safety improvement, revision of procedures and/or working practices*	ALL
ACS HUM 5.1.8	Describe the impact on an ATCO's performance following an occurrence/incident.	2	*Optional content: reporting, SMS, investigation, CISM*	ALL
Subtopic HUM 5.2 — Violation of rules				
ACS HUM 5.2.1	Explain the causes and dangers of violation of rules becoming accepted as a practice.	2	*Optional content: ICAO Circular 314 — AN/178 Threat and Error Management (TEM) in Air Traffic Control*	ALL

TOPIC HUM 6 — COLLABORATIVE WORK				
Subtopic HUM 6.1 — Communication				
ACS HUM 6.1.1	Use communication effectively in ATC.	3		ALL
ACS HUM 6.1.2	Analyse examples of pilot–controller communication for effectiveness.	4		ALL
Subtopic HUM 6.2 — Collaborative work within the same area of responsibility				
ACS HUM 6.2.1	List communication means between controllers in charge of the same area of responsibility (sector or tower).	1	*Optional content: electronic, written, verbal and non-verbal communication*	ALL
ACS HUM 6.2.2	Explain consequences of the use of communication means on effectiveness.	2	*Optional content: strip legibility and encoding, label designation, feedback*	ALL
ACS HUM 6.2.3	List possible actions to provide a safe position handover.	1	*Optional content: rigour, preparation, overlap time*	ALL
ACS HUM 6.2.4	Explain consequences of a missed position handover process.	2		ALL
Subtopic HUM 6.3 — Collaborative work between different areas of responsibility				
ACS HUM 6.3.1	List factors and means for an effective coordination between sectors and/or tower positions.	1	*Optional content: other sectors' constraints, electronic coordination tools*	ALL
Subtopic HUM 6.4 — Controller–pilot cooperation				
ACS HUM 6.4.1	Describe parameters affecting controller–pilot cooperation.	2	*Optional content: workload, mutual knowledge, controller versus pilot mental picture*	ALL

SUBJECT 8: EQUIPMENT AND SYSTEMS

The subject objective is:

Learners shall integrate knowledge and understanding of the basic working principles of equipment and systems, and comply with the equipment and system degradation procedures in the provision of ATS.

TOPIC EQPS 1 — VOICE COMMUNICATIONS				
Subtopic EQPS 1.1 — Radio communications				
ACS EQPS 1.1.1	Operate two-way communication equipment.	3	Transmit/receive switches, procedures *Optional content: frequency selection, standby equipment*	ALL
ACS EQPS 1.1.2	Identify indications of operational status of radio equipment.	3	*Optional content: indicator lights, serviceability displays, selector/frequency displays*	ALL
ACS EQPS 1.1.3	Consider radio range.	2	*Optional content: transfer to another frequency, apparent radio failure, failure to establish radio contact, frequency protection range*	APP ACP APS ACS
Subtopic EQPS 1.2 — Other voice communications				
ACS EQPS 1.2.1	Operate landline communications.	3	*Optional content: telephone, interphone and intercom equipment*	ALL

TOPIC EQPS 2 — AUTOMATION IN ATS				
Subtopic EQPS 2.1 — Aeronautical fixed telecommunication network (AFTN)				
ACS EQPS 2.1.1	Decode AFTN messages.	3	*Optional content: movement and control messages, NOTAMs, SNOWTAMs, BIRDTAMs, etc.*	ALL
Subtopic EQPS 2.2 — Automatic data interchange				
ACS EQPS 2.2.1	Use automatic data transfer equipment where available.	3	*Optional content: sequencing systems, automated information and coordination, OLDI*	ADV ADI APS ACS

TOPIC EQPS 3 — CONTROLLER WORKING POSITION				
Subtopic EQPS 3.1 — Operation and monitoring of equipment				
ACS EQPS 3.1.1	Monitor the technical integrity of the controller working position.	3	Notification procedures, responsibilities	ALL
ACS EQPS 3.1.2	Operate the equipment of the controller working position.	3	*Optional content: situation displays, flight progress board, flight data display, radio, telephone, maps and charts, strip-printer, clock, information systems, UDF/VDF*	ALL
ACS EQPS 3.1.3	Operate available equipment in abnormal and emergency situations.	3		ALL

Subtopic EQPS 3.2 — Situation displays and information systems				
ACS EQPS 3.2.1	Use situation displays.	3		ALL
ACS EQPS 3.2.2	Check availability of information.	3		ALL
ACS EQPS 3.2.3	Obtain information from equipment.	3		APP ACP APS ACS
Subtopic EQPS 3.3 — Flight data systems				
ACS EQPS 3.3.1	Use the flight data information at controller working position.	3		ALL
Subtopic EQPS 3.4 — Use of ATS surveillance system				
ACS EQPS 3.4.1	Use the ATS surveillance system functions.	3		APS ACS
ACS EQPS 3.4.2	Analyse the information provided by the ATS surveillance system.	4		APS ACS
ACS EQPS 3.4.3	Assign codes.	4		APS ACS
ACS EQPS 3.4.4	Appreciate the use of advanced surveillance technology.	3	*Optional content: Mode S, ADS-B, MLAT*	APS ACS
Subtopic EQPS 3.5 — Advanced systems				
ACS EQPS 3.5.1	Appreciate the use of controller–pilot data link communications when available.	3		APS ACS
ACS EQPS 3.5.2	Appreciate the use of information provided by advanced systems.	3	*Optional content: trajectory-based information, MTCD, MONA, etc.*	APS ACS

TOPIC EQPS 4 — FUTURE EQUIPMENT				
Subtopic EQPS 4.1 — New developments				
ACS EQPS 4.1.1	Recognise future developments.	1	New advanced systems	ALL

TOPIC EQPS 5 — EQUIPMENT AND SYSTEMS' LIMITATIONS AND DEGRADATION				
Subtopic EQPS 5.1 — Reaction to limitations				
ACS EQPS 5.1.1	Take account of the limitations of equipment and systems.	2		ALL
ACS EQPS 5.1.2	Respond to technical deficiencies of the operational position.	3	Notification procedures, responsibilities	ALL

Subtopic EQPS 5.2 — Communication equipment degradation				
ACS EQPS 5.2.1	Identify that communication equipment has degraded.	3	*Optional content: ground–air and landline communications*	APP ACP APS ACS
ACS EQPS 5.2.2	Apply contingency procedures in the event of communication equipment degradation.	3	*Optional content: procedures for total or partial degradation of ground–air and landline communications, alternative methods of transferring data*	APP ACP APS ACS
Subtopic EQPS 5.3 — Navigational equipment degradation				
ACS EQPS 5.3.1	Identify when a navigational equipment failure will affect operational ability.	3	*Optional content: VOR, navigational aids*	ALL
ACS EQPS 5.3.2	Apply contingency procedures in the event of a navigational equipment degradation.	3	*Optional content: vertical separation, information to aircraft, navigational assistance, seeking assistance from adjacent units*	ADI APP ACP APS ACS
Subtopic EQPS 5.4 — Surveillance equipment degradation				
ACS EQPS 5.4.1	Identify that surveillance equipment has degraded.	3	Partial power failure, loss of certain facilities, total failure	APS ACS
ACS EQPS 5.4.2	Apply contingency procedures in the event of surveillance equipment degradation.	3	*Optional content: inform adjacent sectors, inform aircraft, apply vertical separation (emergency), increased horizontal separation, reduce the number of aircraft entering area of responsibility, transfer aircraft to another unit*	APS ACS
Subtopic EQPS 5.5 — ATC processing system degradation				
ACS EQPS 5.5.1	Identify a processing system degradation.	3	*Optional content: FDPS, SDPS, software processing of situation display*	APS ACS
ACS EQPS 5.5.2	Apply contingency procedures in the event of a processing system degradation.	3		APS ACS

SUBJECT 9: PROFESSIONAL ENVIRONMENT

The subject objective is:

Learners shall identify the need for close cooperation with other parties concerning ATM operations and appreciate aspects of environmental protection.

TOPIC PEN 1 — FAMILIARISATION				
Subtopic PEN 1.1 — Study visit to an area control centre				
ACS PEN 1.1.1	Appreciate the functions and provision of operational area control service.	3	Study visit to an area control centre	ACP ACS

TOPIC PEN 2 — AIRSPACE USERS				
Subtopic PEN 2.1 — Contributors to civil ATS operations				
ACS PEN 2.1.1	Characterise civil ATS activities in area control centre.	2	Study visit to an area control centre *Optional content: familiarisation visits to TWR, APP, AIS, RCC*	ACP ACS
ACS PEN 2.1.2	Characterise other parties interfacing with ATS operations.	2	*Optional content: familiarisation visits to engineering services, firefighting and emergency services, airline operations offices*	ALL
Subtopic PEN 2.2 — Contributors to military ATS operations				
ACS PEN 2.2.1	Characterise military ATS activities.	2	*Optional content: familiarisation visits to TWR, APP, ACC, AIS, RCC, Air Defence Units*	ALL

TOPIC PEN 3 — CUSTOMER RELATIONS				
Subtopic PEN 3.1 — Provision of services and user requirements				
ACS PEN 3.1.1	Identify the role of ATC as a service provider.	3		ALL
ACS PEN 3.1.2	Appreciate ATS users' requirements.	3		ALL

TOPIC PEN 4 — ENVIRONMENTAL PROTECTION				
Subtopic PEN 4.1 — Environmental protection				
ACS PEN 4.1.1	Appreciate the mitigation techniques used en-route to minimise the aviation's impact on the environment.	3	*Optional content: free route airspace (FRA), night/weekend routes, continuous descent operations (CDO), continuous climb operations (CCO), ICAO Circular 303 — Operational Opportunities to Minimize Fuel Use and Reduce Emissions*	ACP ACS

SUBJECT 10: ABNORMAL AND EMERGENCY SITUATIONS

The subject objective is:

Learners shall develop a professional attitude to manage traffic in abnormal and emergency situations.

TOPIC ABES 1 — ABNORMAL AND EMERGENCY SITUATIONS (ABES)				
Subtopic ABES 1.1 — Overview of ABES				
ACS ABES 1.1.1	List common abnormal and emergency situations.	1	*Optional content: EATM Guidelines for Controller Training in the Handling of Unusual/Emergency Situations, ambulance flights, ground-based safety nets alerts, airframe failure, unreliable instruments, runway incursion*	ALL
ACS ABES 1.1.2	Identify potential or actual abnormal and emergency situations.	3		ALL
ACS ABES 1.1.3	Take into account the procedures for given abnormal and emergency situations.	2	*Optional content: ICAO Doc 4444*	APP ACP APS ACS
ACS ABES 1.1.4	Take into account that procedures do not exist for all abnormal and emergency situations.	2	*Optional content: real-life examples*	ALL
ACS ABES 1.1.5	Consider how the evolution of a situation may have an impact on safety.	2	*Optional content: separation, information, coordination*	ALL

TOPIC ABES 2 — SKILLS IMPROVEMENT				
Subtopic ABES 2.1 — Communication effectiveness				
ACS ABES 2.1.1	Ensure effective communication in all circumstances including the case where standard phraseology is not applicable.	4	Phraseology, vocabulary, readback, radio silence instruction	ALL
Subtopic ABES 2.2 — Avoidance of mental overload				
ACS ABES 2.2.1	Describe actions to keep the situation under control.	2	*Optional content: sector-splitting, holding, flow management, task delegation*	ALL
ACS ABES 2.2.2	Organise priority of actions.	4		ALL
ACS ABES 2.2.3	Ensure effective dissemination of information.	4	*Optional content: between executive and planner/coordinator, with the supervisor, between sectors, between ACC, APP and TWR, with ground staff, etc.*	ALL
ACS ABES 2.2.4	Consider asking for help.	2		ALL

Subtopic ABES 2.3 — Air–ground cooperation				
ACS ABES 2.3.1	Collect appropriate information relevant to the situation.	3		ALL
ACS ABES 2.3.2	Assist the pilot.	3	Pilot workload *Optional content: instructions, information, support, human factors, etc.*	ALL
TOPIC ABES 3 — PROCEDURES FOR ABNORMAL AND EMERGENCY SITUATIONS (ABES)				
Subtopic ABES 3.1 — Application of procedures for ABES				
ACS ABES 3.1.1	Apply the procedures for given abnormal and emergency situations.	3	*Optional content: EATM Guidelines for Controller Training in the Handling of Unusual/Emergency Situations, ambulance flights, ground-based safety nets alerts, airframe failure*	ALL
Subtopic ABES 3.2 — Radio failure				
ACS ABES 3.2.1	Describe the procedures to be followed by a pilot when that pilot experiences complete or partial radio failure.	2	*Optional content: ICAO Doc 4444, military procedures*	ALL
ACS ABES 3.2.2	Apply the procedures to be followed when a pilot experiences complete or partial radio failure.	3	*Optional content: prolonged loss of communication*	ALL
Subtopic ABES 3.3 — Unlawful interference and aircraft bomb threat				
ACS ABES 3.3.1	Apply ATC procedures associated with unlawful interference and aircraft bomb threat.	3		ALL
Subtopic ABES 3.4 — Strayed or unidentified aircraft				
ACS ABES 3.4.1	Apply the procedures in the case of strayed aircraft.	3	*Optional content: inside controlled airspace, outside controlled airspace*	ALL
ACS ABES 3.4.2	Apply the procedures in the case of unidentified aircraft.	3		ALL
Subtopic ABES 3.5 — Diversions				
ACS ABES 3.5.1	Provide navigational assistance to aircraft diverting in emergency.	4	Track/heading, distance, other navigational assistance *Optional content: nearest most suitable aerodrome*	APP ACP APS ACS
Subtopic ABES 3.6 — Transponder failure				
ACS ABES 3.6.1	Apply procedures in the event of an SSR transponder failure.	3	*Optional content: total/partial failure, impact on ADS-B/Mode S capability*	APS ACS