Network Manager
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EUROCONTROL

EUROCONTROL Specification

EUROCONTROL Specifications for the ATCO Common Core Content Initial Training

Annex 1: Basic training syllabus

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EUROPEAN ORGANISATION
FOR THE SAFETY OF AIR NAVIGATION

EUROCONTROL

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Annex 1 – Basic training syllabus

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EXECUTIVE SUMMARY

Annex 1 of the EUROCONTROL Specification for the ATCO Common Core Content Initial Training V2.0 details the training objectives for the **Basic ATC training**.

For training organisations providing ATCO training to meet the requirements laid down in the **Commission Regulation (EU) 2015/340 laying down technical requirements and administrative procedures relating to air traffic controllers' licences and certificates**, and the acceptable means of compliance (AMCs) associated with the regulation, this syllabus does not change any of the content in the regulation, but rather provides a document that combines the relevant elements into a familiar user format. For European organisations not required to comply with EU legislation, it provides an **ATC Basic training syllabus** that retains references to ICAO documentation.

Basic training is defined ***as theoretical and practical training designed to impart fundamental knowledge and practical skills related to basic operational procedures.***

The composition and topics were chosen based on the **Commission Regulation (EU) 2015/340** Annex I — Basic training (Reference: Annex I — Part ATCO Subpart D, Section 2, ATCO.D.010(a)(1)) and ICAO Annex 1 requirements for an Air Traffic Control licence. The structure of the syllabus reflects a logical grouping of objectives into coherent subjects.

The order of subjects and objectives is neither intended to convey a pedagogical sequence nor to indicate a relative level of importance. No recommendation is made in this area. When teaching the objectives, it is envisaged that different training methodologies will be used.

Prior to developing or updating the **Basic training course,** training providers must be familiar with the information contained in the EUROCONTROL Specification for the ATCO Common Core Content Initial Training V2.0, particularly Section 6 (How to use this document) which contains, amongst other items, the fundamental principles that are applied to the Specification.

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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 course administration.	1	
Subtopic INTRB 1.3 - Study material and training documentation			
BASIC INTRB 1.3.1	Use appropriate documentation 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 applied in the course.	1	Theoretical training, practical training, self-study, types of training events
BASIC INTRB 2.1.2	State the subjects of 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	Team work 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 rules of the air, airspace and flight planning and explain their development or where applicable 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 EU legislation, ICAO Convention 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, ECAC, EASA, EUROCONTROL, 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 - European and other agencies			
BASIC LAWB 2.2.1	Explain the purpose and functions of EUROCONTROL.	2	Network manager function
BASIC LAWB 2.2.2	Explain the purpose and functions of EASA.	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*

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 information package, national legislation, letters of agreement, operations manual*
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	

TOPIC LAWB 4 - ATS SAFETY MANAGEMENT

Subtopic LAWB 4.1 - Safety regulation

BASIC LAWB 4.1.1	Describe the need for safety regulation.	2	Regulation (EC) 216/2008 ICAO Doc 4444 *Optional content: Commission Implementing Regulation (EU) No 1034/2011, national regulation*
BASIC LAWB 4.1.2	Describe the general principles of the safety organisation.	2	Safety regulation Safety regulation *Optional content: Regulation (EU) No 1035/2011, national regulation*
BASIC LAWB 4.1.3	Explain the impact of safety regulation on the controller.	2	*Optional content: Regulation (EU) 2015/340 on 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	Regulation (EU) No 1035/2011 ICAO Doc 4444
BASIC LAWB 4.2.2	Explain the principles of the safety management systems.	2	Regulation (EU) No 1035/2011 ICAO Doc 4444
BASIC LAWB 4.2.3	Describe the safety assessment methodology.	2	Regulation (EU) No 1035/2011, Regulation (EU) No 1034/2011 ICAO Doc 4444 *Optional content: EATMP 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	COUNCIL DIRECTIVE of 20 December 1979 on units of measurement ICAO Annex 5

Subtopic LAWB 5.2 - ATCO licensing/certification			
BASIC LAWB 5.2.1	Explain the ATCO licensing/certification process.	2	Regulation (EU) 2015/340 on ATCO Licensing, Approved training courses, ATCO licence, ratings and endorsements ICAO Annex 1 *Optional content: national processes*
BASIC LAWB 5.2.2	Explain the privileges and limitations of controller licences.	2	Regulation (EU) 2015/340 on ATCO Licensing ICAO Annex 1
Subtopic LAWB 5.3 - Overview of ANS and ATS			
BASIC LAWB 5.3.1	Differentiate between the Air Navigation Services.	2	Regulation (EC) No 216/2008, Regulation (EC) No 549/2004 ICAO Doc 9161
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	Regulation (EU) No 923/2012 ICAO Annex 11
Subtopic LAWB 5.4 - Rules of the air			
BASIC LAWB 5.4.1	Explain the Rules of the Air.	2	Regulation (EU) No 923/2012 ICAO Annex 2
BASIC LAWB 5.4.2	State any notified differences with ICAO.	1	Regulation (EU) No 923/2012 ICAO Doc 7030 *Optional content: Supplements to ICAO Annex 2 and ICAO Annex 11*
BASIC LAWB 5.4.3	Appreciate the influence of relevant flight rules on ATC.	3	General flight rules, instrument flight rules, visual flight rules
BASIC LAWB 5.4.4	Appreciate the differences between flying in accordance with VFR and IFR, in VMC and IMC.	3	Regulation (EU) No 923/2012 ICAO Annex 2
Subtopic LAWB 5.5 - Airspace and ATS routes			
BASIC LAWB 5.5.1	Explain airspace classification.	2	Regulation (EU) No 923/2012 ICAO Classes A-G, ICAO Annex 11
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.*

Subtopic LAWB 5.5 - Airspace and ATS routes			
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	Regulation (EU) No 923/2012, ICAO Doc 4444 ICAO Annex 2, ICAO Doc 4444
BASIC LAWB 5.6.2	Explain the different types of flight plans and associated update messages.	2	Regulation (EU) No 923/2012, ICAO Doc 4444 ICAO Doc 4444
BASIC LAWB 5.6.3	Explain the pilot's responsibilities in relation to adherence to flight plan.	2	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	Regulation (EU) No 139/2014 - EASA ED Decision 2014/013/R for CS-ADR-DSN - Initial issue and EASA ED Decision 2014/012/R for ADR AMC/GM 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	
BASIC LAWB 5.7.5	List the factors affecting the selection of runway in use.	1	

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 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 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	Regulation (EU) No 923/2012 ICAO Annex 11
BASIC ATMB 1.2.2	Explain the division of the ATC service.	2	Regulation (EC) No 549/2004, ICAO Annex 11 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	Regulation (EU) No 923/2012 ICAO Annex 11
BASIC ATMB 1.3.2	Describe the scope of the FIS.	2	Regulation (EU) No 923/2012 ICAO Annex 11
BASIC ATMB 1.3.3	Explain the responsibility for the provision of the FIS.	2	Regulation (EU) No 923/2012, ICAO Doc 4444 ICAO Doc 4444, ICAO Annex 11
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	Regulation (EU) No 923/2012, ICAO Annex 3 ICAO Annex 11, ICAO Annex 3 *Optional content: meteorological data obtained by data link*

Subtopic ATMB 1.3 - Flight information service (FIS)			
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.*
Subtopic ATMB 1.4 - Alerting service			
BASIC ATMB 1.4.1	Define ALRS.	1	Regulation (EU) No 923/2012 ICAO Annex 11
BASIC ATMB 1.4.2	Describe the scope of the ALRS.	2	Regulation (EU) No 923/2012, ICAO Annex 11 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.*
Subtopic ATMB 1.5 - Air traffic advisory service			
BASIC ATMB 1.5.1	Define Air Traffic Advisory Service.	1	Regulation (EU) No 923/2012 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
Subtopic ATMB 1.6 - ATS system capacity and air traffic flow management			
BASIC ATMB 1.6.1	Define ATFM.	1	Regulation (EC) No 549/2004 ICAO Annex 11

Subtopic ATMB 1.6 - ATS system capacity and air traffic flow management			
BASIC ATMB 1.6.2	State the scope of capacity management.	1	Regulation (EU) No 255/2010, ICAO Doc 4444 ICAO Annex11, ICAO Doc 4444, ICAO Doc 7030
BASIC ATMB 1.6.3	Describe the scope of ATFCM.	2	Regulation (EU) No 255/2010, ICAO Doc 4444, EUROCONTROL ATFCM Users Manual ICAO Annex11, ICAO Doc 4444, ICAO Doc 7030, EUROCONTROL ATFCM Users Manual
BASIC ATMB 1.6.4	Explain the responsibility for the provision of ATFCM.	2	Regulation (EU) No 255/2010, ICAO Doc 4444, EUROCONTROL ATFCM Users Manual ICAO Annex11, ICAO Doc 4444, ICAO Doc 7030, EUROCONTROL ATFCM Users Manual
BASIC ATMB 1.6.5	Explain the methods of providing ATFCM.	2	Regulation (EU) No 255/2010, ICAO Doc 4444, EUROCONTROL ATFCM Users Manual ICAO Doc 4444, EUROCONTROL ATFCM Users Manual
Subtopic ATMB 1.7 - Airspace management (ASM)			
BASIC ATMB 1.7.1	Define ASM.	1	Regulation (EC) No 549/2004 EUROCONTROL ASM HBK- Airspace Management Handbook for the application of FUA *Optional content: Commission Regulation (EC) No 2150/2005,*
BASIC ATMB 1.7.2	Describe the scope of ASM.	2	Regulation (EC) No 2150/2005 EUROCONTROL ASM HBK- Airspace Management Handbook for the application of FUA *Optional content: FABs, EUROCONTROL Specification for the application of the FUA*
BASIC ATMB 1.7.3	Explain the responsibility for the provision of ASM.	2	Regulation (EC) No 2150/2005 EUROCONTROL ASM HBK- Airspace Management Handbook for the application of FUA *Optional content: EUROCONTROL Specification for the application of the FUA*
BASIC ATMB 1.7.4	Explain the methods of managing airspace.	2	Regulation (EC) No 2150/2005 EUROCONTROL ASM HBK- Airspace Management Handbook for the application of FUA *Optional content: Flexible use of airspace, airspace design, CDRs, TSAs*

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, ICAO Doc 8168
BASIC ATMB 2.2.2	Calculate 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	Regulation (EU) No 923/2012, table of cruising levels ICAO Doc 4444, ICAO Annex 2 - tables of cruising levels
BASIC ATMB 2.3.2	Choose 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	Parts of the following documents relevant to the Basic course: ICAO Doc 4444, ICAO Doc 9432 RTF manual - standard words and phrases, ICAO Annex 10 Vol. 2
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	Regulation (EU) No 923/2012 ICAO Annex 2
BASIC ATMB 4.1.2	Describe the contents of an ATC clearance.	2	Regulation (EU) No 923/2012, ICAO Doc 4444 ICAO Doc 4444, ICAO Annex 11
BASIC ATMB 4.1.3	Issue appropriate ATC clearances.	3	ICAO Doc 4444 *Optional content: national documents*
Subtopic ATMB 4.2 - ATC instructions			
BASIC ATMB 4.2.1	Define ATC Instructions.	1	Regulation (EU) No 923/2012 ICAO Doc 4444
BASIC ATMB 4.2.2	Describe the contents of an ATC instruction.	2	ICAO Doc 4444, ICAO Annex 11
BASIC ATMB 4.2.3	Issue appropriate ATC instructions.	3	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 *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	*Optional content: ICAO Doc 4444, local procedures, letters of agreements*
BASIC ATMB 5.2.2	Differentiate between transfer of control and transfer of communication procedures.	2	

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 longitudinal separation standards and procedures based on time and distance.	1	ICAO Doc 4444
BASIC ATMB 7.2.2	State the lateral separation standards and procedures.	1	ICAO Doc 4444

Subtopic ATMB 7.3 - Visual separation			
BASIC ATMB 7.3.1	State the occasions when clearance to fly 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 European requirement for carriage of airborne collision avoidance system.	1	Regulation (EU) No 1332/2011 ICAO Doc 8168
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	Regulation (EU) No 1332/2011, ICAO Doc 8168 ICAO Doc 8168
BASIC ATMB 8.1.4	List the actions of the pilot in case of TA and RA.	1	Regulation (EU) No 1332/2011, ICAO Doc 8168 ICAO Doc 8168

Subtopic ATMB 8.1 - Airborne collision avoidance systems			
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 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	

Subtopic ATMB 9.2 - Basic practical skills applicable to all ratings			
BASIC ATMB 9.2.9	Choose 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 of establishing identification.	3	Any of the ATS surveillance systems identification methods
BASIC ATMB 9.4.3	Estimate heading for a new track and the distance to the next way point.	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	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
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 on European weather.	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, Föhn, 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, Föhn, surface, upper*
BASIC METB 3.4.2	State how wind is measured.	1	
BASIC METB 3.4.3	Explain 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 *Optional content: thunderstorms, 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, inter-cardinal 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	

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
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 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

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	Differentiate between the methods of visual navigation.	2	Map reading, visual reference *Optional content: dead-reckoning*
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*

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, MLS*
BASIC NAVB 5.1.2	State the use of ground-based systems.	1	VDF, NDB, VOR, DME, ILS *Optional content: TACAN, MLS*
BASIC NAVB 5.1.3	Characterise the main radio navigation techniques based on ground-based systems.	2	*Optional content: homing, inbound/outbound tracking, instrument approach procedures, holding, drift assessment*
BASIC NAVB 5.1.4	Explain the effects of precision and limitations of ground-based systems on the flight.	2	VDF, NDB, VOR, DME, ILS *Optional content: TACAN, MLS*
Subtopic NAVB 5.2 - Inertial navigation systems			
BASIC NAVB 5.2.1	Explain the basic working principles, precision and limitations of on-boards 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 positioning systems.	2	*Optional content: GPS, GLONASS, Galileo*
BASIC NAVB 5.3.2	State the basic principles of GNSS concept.	1	Basic, ABAS, SBAS, GBAS
BASIC NAVB 5.3.3	Explain the effects of precision and limitations of satellite-based systems.	2	*Optional content: RAIM, GPS Notams*
Subtopic NAVB 5.4 - Instrument approach procedures			
BASIC NAVB 5.4.1	Recognise various types of instrument approach using aeronautical charts.	1	
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 obstacle clearance altitude/height and minimum descent altitude/height.	1	
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: ICAO Doc 9613*
BASIC NAVB 6.1.2	State the benefits of area navigation.	1	*Optional content: ICAO Doc 9613*

Subtopic NAVB 6.1 - Principles and benefits of area navigation			
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: ICAO Doc 9613*
BASIC NAVB 6.1.4	Characterise the main aircraft and avionics functionalities used in area navigation.	2	*Optional content: waypoints transitions (FRT) and path terminators (including RF), fly over and fly by a waypoint, parallel offset*
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	*Optional content: ICAO Doc 9613*
BASIC NAVB 6.2.2	Differentiate between RNAV and RNP.	2	On board performance monitoring and alerting
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*
Subtopic NAVB 6.3 - PBN applications			
BASIC NAVB 6.3.1	List the navigation applications in use in Europe.	1	En-route, terminal/approach *Optional content: RNAV-5 (B-RNAV), RNAV-1 (≈ P-RNAV)*

TOPIC NAVB 7 - DEVELOPMENTS IN NAVIGATION

Subtopic NAVB 7.1 - Future developments			
BASIC NAVB 7.1.1	State future developments in navigation.	1	

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	*Optional content: 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	*Optional content: fixed wing, rotary wing, balloon, glider*

Subtopic ACFTB 3.2 - Wake turbulence categories

BASIC ACFTB 3.2.1	List the wake turbulence categories.	1	ICAO wake turbulence categories

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.	1	ICAO Annex 16

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, MLS, 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, 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
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
Subtopic ACFTB 7.7 - Environmental factors			
BASIC ACFTB 7.7.1	Explain performance restrictions due to environmental constraints.	2	*Optional content: continuous descent operation (CDO), fuel dumping, noise abatement procedures, minimum flight levels*

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 systems 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

Subtopic HUMB 1.3 - Human factors and ATC			
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 between people.	2	*Optional content: attitudes, 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 attitudes 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*

Subtopic HUMB 2.6 - 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 communications in ATC			
BASIC HUMB 4.1.1	Appreciate the importance of good communications 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, work station 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 in general use 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 datalink 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 datalinks 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 - On-line 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 communications
BASIC EQPSB 10.3.2	Describe the limitations of automatic exchange of ATS data in coordination.	2	Non-recognition of a systems 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	

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 communication 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: fire 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, gliders, balloons, calibration flights, aerial photography, parachute dropping, UASs*
Subtopic PENB 2.2 - Military			
BASIC PENB 2.2.1	Describe airspace usage by the military.	2	Airspace reservations, training, interception, in-flight refuelling, UASs *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: EU ETS, SES initiative, EUROCONTROL role, continuous descent operations (CDO), collaborative environmental management (CEM)*

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