MILITARY AIR TRAFFIC CONTROLLER
INITIAL TRAINING

Basic training composition

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MILITARY AIR TRAFFIC CONTROLLER WORKING GROUP

DOCUMENT CHANGE RECORD

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1.0	6 December 2023	Approved	Initial issue	All

STATUS

The Status of the document can take 3 values:

Working Draft: Working copy to develop the proposed version or revision of the document.

Draft: Version to be proposed to the ESMAB Policy by the MATCO Working Group

Approved: Final version approved* by the ESMAB Policy for publication.

EDITION

The Edition value of document will have the following template: **Edition X.YY**:

The **value of X** will change after a **major** revision of the document.

The **value of Y** will change after a **minor** revision of the document.

* It should be noted that the approval by ESMAB Policy is given with the clear understanding that the document is legally non-binding and its potential implementation remains fully a decision to be taken at national level.

TABLE OF CONTENTS

COMPOSITION OF MILITARY ATCO BASIC TRAINING:

For reference use: AMC1 ATCO.D.010(a) Composition of initial training

All the following content comes from EASA AMC and includes the amendments coming from the Commission Implementing Regulation (EU) 2023/893 of 21 April 2023 amending Commission Regulation (EU) 2015/340 which was published in the Official Journal of the EU on 4 May 2023.

These amendments are drafted according to the EASA regulatory convention for the introduction of changes compared to applicable provisions, i.e.:

~~Red strikethrough~~ = text deleted

Light blue background = new text inserted

Number represents the level of taxonomy as for AMC1 ATCO.D.010(a) Composition of initial training.

Mandatory content should be understood as training content provided in all Member States.

Optional content should be understood as content that might be omitted in Member States where this is not applicable.

Military ATCO Initial Basic training should contain the following subjects, topics, subtopics and training objectives using as baseline the subjects, topics and subtopics contained in Appendix 2 to Annex I to Commission Regulation (EU) 2015/340 — Basic training. This might indeed facilitate the potential latter conversion of Military ATCO licences into Civil Student ATCO licences.

The taxonomy of some of the training objectives identified in EASA AMC1 ATCO.D.010(a)(1) to Commission Regulation (EU) 2015/340 have been highlighted in bright green where they required to be adapted to the working requirements and needs of Military ATCOs.

Additional topics, subtopics and training objectives have also been identified and included in bright yellow in the Initial Basic Training content to take into account the specific training requirements of Military ATCOs.

The composition of the Military ATCO Basic Training as presented in this document are the minimum requirements recommended to be implemented by interested military ATCO training organisations. Any Member State might decide to train its military ATCOs giving one or several of the training objectives a higher level of importance hence a higher taxonomy level.

Despite the fact that this document is legally non-binding, in order to achieve standardisation in the initial basic training of Military ATCOs, Member States should apply its content as proposed.

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~~ Collect appropriate information into course studies.	~~4~~ 3	Training documentation *Optional content: supplementary information, library*

TOPIC INTRB 2 — INTRODUCTION TO THE ATC TRAINING COURSE			
Subtopic INTRB 2.1 — Course content, methodology 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*
BASIC INTRB 2.1.5	Appreciate appropriate learning techniques.	3	How the influence of interactive techniques can lead to improved learning
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 *Optional content: specific MIL working positions*
BASIC INTRB 3.1.2	Recognise career developments.	1	*Optional content: OJT instructor, assessor, 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 EU legislation, ICAO Convention *Optional content: ICAO Annex 2, national civil and military 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~~2	Describe the impact that key international and national ~~these~~ organisations have on ATC and their interaction with each other.	2	ICAO, NATO, EDA, EASA, EUROCONTROL, national civil and military organisations

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, WMO*
BASIC LAWBMIL 2.2.4	Explain the purpose and functions of NATO and EDA, with a specific focus on ANS and ATCO related activities.	2	NATO STANAGs EDA Single European Sky activities
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~~ National civil and military authorities			
BASIC LAWB 3.1.1	Describe the purpose and function of appropriate national civil and military agencies and their relevance to air traffic operations.	2	*Optional content: civil and military aviation administration agencies, government agencies*

TOPIC LAWB 3 — NATIONAL ORGANISATIONS			
Subtopic LAWB 3.2 — National legislative procedures			
BASIC LAWB 3.2.1	Recognise ~~Describe the means by which~~ how civil and military legislations are implemented, notified and updated.	~~2~~ 1	~~ICAO Annex 15~~ ~~*Optional content: AIS, AIPs, AIRAC, SUPs, AICs, NOTAMs, integrated aeronautical information package, national legislation, letters of agreement, operations manual,*~~ *Optional content: AIS, AIPs, AIRAC, SUPs, AICs, NOTAMs, integrated aeronautical information package, national legislation, letters of agreement, operations manual civil-military coordination board*
~~BASIC LAWB 3.2.2~~	~~Recognise the information contained in the different parts of the AIP.~~	~~1~~	
Subtopic LAWB 3.3 — Competent civil and military authorities			
BASIC LAWB 3.3.1	Name the competent civil and military authorities~~y~~ responsible for ATCO licensing and oversight of ANSPs. ~~enforcing legislation and operational procedures.~~	1	
BASIC LAWB 3.3.2	State ~~Describe~~ how the competent civil and military authorities~~y~~ carry~~ies~~ out their ~~its~~ safety oversight ~~regulation~~ responsibilities.	~~2~~ 1	
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 (EU) 2018/1139[1] National Military regulations and directives *Optional content : Regulation (EU) 2017/373[2], national civil regulations*
BASIC LAWB 4.1.2	Describe the general principles of ~~the~~ safety regulation. ~~Organisation.~~	2	~~Safety regulation~~ *Optional content: Regulation (EU) 2017/373, national civil and military regulations and directives*
BASIC LAWB	Explain the impact of safety regulation on the controller.	2	*Optional content: Regulation (EU) 2015/340[3], ~~on ATCO licensing~~ Regulation (EU) 2017/373*

[1] Regulation (EU) 2018/1139 of the European Parliament and of the Council of 4 July 2018 on common rules in the field of civil aviation and establishing a European Union Aviation Safety Agency, and amending Regulations (EC) No 2111/2005, (EC) No 1008/2008, (EU) No 996/2010, (EU) No 376/2014 and Directives 2014/30/EU and 2014/53/EU of the European Parliament and of the Council, and repealing Regulations (EC) No 552/2004 and (EC) No 216/2008 of the European Parliament and of the Council and Council Regulation (EEC) No 3922/91 (OJ L 212, 22.8.2018, p. 1).

[2] Commission Implementing Regulation (EU) 2017/373 of 1 March 2017 laying down common requirements for providers of air traffic management/air navigation services and other air traffic management network functions and their oversight, repealing Regulation (EC) No 482/2008, Implementing Regulations (EU) No 1034/2011, (EU) No 1035/2011 and (EU) 2016/1377 and amending Regulation (EU) No 677/2011 (OJ L 62, 8.3.2017, p. 1).

[3] Commission Regulation (EU) 2015/340 of 20 February 2015 laying down technical requirements and administrative procedures relating to air traffic controllers' licences and certificates pursuant to Regulation (EC) No 216/2008 of the

TOPIC LAWB 4 — ATS SAFETY MANAGEMENT			
4.1.3			*National military regulations and directives*
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) 2017/373 National military regulations and directives
BASIC LAWB 4.2.2	Explain the principles of the safety management systems.	2	Regulation (EU) 2017/373 National military regulations and directives
BASIC LAWB 4.2.3	Describe the safety assessment methodology.	2	Regulation (EU) 2017/373 National military regulations and directives *Optional content: EATMP Air navigation system safety assessment methodology, national civil regulations*

TOPIC LAWB 5 — RULES AND REGULATIONS			
Subtopic LAWB 5.1 — Units of measurement			
BASIC LAWB 5.1.1	List ~~Describe~~ the units of measurement used in aviation.	~~2~~ 1	Council Directive 80/181/EEC on units of measurement[1], ICAO Annex 5
Subtopic LAWB 5.2 — ATCO licensing/certification			
BASIC LAWB 5.2.1	Explain the ATCO licensing/certification process.	2	Military ATCO licensing/certification national regulations and directives Regulation (EU) 2015/340 ~~on ATCO Licensing~~, Approved training courses; ATCO licences, ratings, endorsements and certifications[2] *Optional content: national civil processes*
BASIC LAWB 5.2.2	Explain the privileges and limitations of controller licences.	2	Military ATCO licensing/certification national regulations and directives Regulation (EU) 2015/340 ~~on ATCO Licensing~~
Subtopic LAWB 5.3 — Overview of ANS ~~and ATS~~			
BASIC LAWB 5.3.1	Differentiate between the Air Navigation Services.	2	Regulation (EU) 2018/1139, Regulation (EC) No 549/2004[3]
Subtopic LAWB 5.4 — Overview of ATS			
BASIC LAWB 5.~~3.2~~4.1	State ~~Explain~~ the considerations which determine the need for the ATS.	~~2~~ 1	~~ICAO Annex 11~~ Regulation (EU) 2017/373
BASIC LAWB	Differentiate between the ATS.	2	ATCS, ADVS, FIS, ALRS

European Parliament and of the Council, amending Commission Implementing Regulation (EU) No 923/2012 and repealing Commission Regulation (EU) No 805/2011 (OJ L 63, 6.3.2015, p. 1).

[1] Council Directive 80/181/EEC of 20 December 1979 on the approximation of the laws of the Member States relating to units of measurement and on the repeal of Directive 71/354/EEC (OJ L 39, 15.2.1980, p. 40).

[2] Certification refers to endorsement for military use only.

[3] Regulation (EC) No 549/2004 of the European Parliament and of the Council of 10 March 2004 laying down the framework for the creation of the single European sky (the framework Regulation) — Statement by the Member States on military issues related to the single European sky (OJ L 96, 31.3.2004, p. 1).

TOPIC LAWB 5 — RULES AND REGULATIONS			
5.~~3.3~~ 4.2			
BASIC LAWB 5.~~3.4~~4.3	Explain the objectives of ATS.	2	Regulation (EU) No 923/2012[1] *Optional content: NATO STANAGS, national civil and military directives*
Subtopic LAWB 5.5 — Overview of Aeronautical Information Management (AIM)			
BASIC LAWB 5.5.1	Describe the means by which Aeronautical Information is notified, updated and disseminated.	2	Military publications Regulation (EU) 2017/373 ~~*ICAO Annex 15*~~ *Optional content: AIS, integrated aeronautical information package (AIPs, AIRAC, SUPs, AICs, NOTAMs), ICAO Annex 15*
BASIC LAWB 5.5.2	Recognise the information contained in the different parts of the AIP.	1	
Subtopic LAWB 5.6~~4~~ — Rules of the air			
BASIC LAWB 5.6~~4~~.1	Explain the rules of the air.	2	National military regulations for the application of the "due regard" concept defined in Article 3 (d) of the ICAO Convention, Regulation (EU) No 923/2012, Flight over the high seas, applicability and compliance, general rules and collision avoidance
BASIC LAWBMIL 5.6.1.1	Explain the differences between Operational Air Traffic and General Air Traffic.	2	Regulation (EC) No 549/2004, EUROCONTROL EUROAT
BASIC LAWBMIL 5.6.1.2	Describe activities and flight procedures for the Operational Air Traffic.	2	NATO STANAGs, EUROCONTROL EUROAT, national military regulations and directives *Optional content: Deployed ATM*
BASIC LAWB 5.6~~4~~.2	State the published ~~any notified~~ differences with ICAO.	1	Regulation (EU) No 923/2012 *Optional content: Supplements to ICAO Annex 2 and ICAO Annex 11*
BASIC LAWB 5.6~~4~~.3	Appreciate the influence of relevant flight rules on ATC.	3	General flight rules, instrument flight rules, visual flight rules
BASIC LAWB 5.6~~4~~.4	Appreciate the differences between flying in accordance with VFR, special VFR and IFR, in VMC and IMC.	3	Regulation (EU) No 923/2012
Subtopic LAWB 5.~~5~~7 — Airspace and ATS routes			
BASIC LAWB 5.~~5~~7.1	Explain airspace classification.	2	Regulation (EU) No 923/2012
BASIC LAWB 5.~~5~~7.2	Differentiate between the different types of airspace.	2	Restricted areas, prohibited and danger areas for military and civil use

[1] Commission Implementing Regulation (EU) No 923/2012 of 26 September 2012 laying down the common rules of the air and operational provisions regarding services and procedures in air navigation and amending Implementing Regulation (EU) No 1035/2011 and Regulations (EC) No 1265/2007, (dEC) No 1794/2006, (EC) No 730/2006, (EC) No 1033/2006 and (EU) No 255/2010 (OJ L 281, 13.10.2012, p. 1).

TOPIC LAWB 5 — RULES AND REGULATIONS			
			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~~7.3	Differentiate between the different types of Military and Civil ATS routes.	2	Airway, arrival route, departure route, advisory route, controlled route, uncontrolled route, etc. *Optional content: TACAN Route, Military RPAS Corridor, etc.*
BASIC LAWB 5.~~5~~7.4	Decode information from Military and Civil 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~~8 — Flight plan			
BASIC LAWB 5.~~6~~8.1	Explain the functions of a flight plan.	2	Regulation (EU) No 923/2012, ICAO Doc 4444 National military regulations and directives
BASIC LAWB 5.~~6~~8.2	Explain the different types of flight plans and associated update messages.	2	Regulation (EU) No 923/2012, ICAO Doc 4444 National military regulations and directives
BASIC LAWB 5.~~6~~8.3	Explain the pilot's responsibilities in relation to adherence to flight plan.	2	Inadvertent changes, intended changes, position reporting
BASIC LAWB 5.~~6~~8.4	Describe flight plan submission and distribution processes~~ing~~.	2	Regulation (EU) No 923/2012 National military regulations and directives ~~*Optional content: AFTN, IFPS*~~
Subtopic LAWB 5.~~7~~9 — Aerodromes			
BASIC LAWB 5.~~7~~9.1	Describe the general design and layout of an aerodrome.	2	Runway(s), taxiways, apron, movement area, manoeuvring area, designated positions on an aerodrome *Optional content: military specific facilities*
BASIC LAWB 5.~~7~~9.2	Explain the numbering system and orientation of runways.	2	Regulation (EU) No 139/2014[1] *Optional: NATO STANAGS, National military regulations and directives*
BASIC LAWB 5.~~7~~9.3	Differentiate between different types of aerodromes.	2	Controlled, uncontrolled *Optional content: ~~military~~, international, regional, mixed*
BASIC LAWB 5.~~7~~9.4	Describe designated positions in the traffic circuit.	2	
BASIC LAWB 5.~~7~~9.5	List the factors, including specific to the military, affecting the selection of runway in use.	1	
BASIC LAWBMIL 5.~~7~~9.6	Explain all special military aerodrome procedures.	2	SFO, Black code, military arresting system and procedures NATO STANAGS operation of civil aircraft on military airfield *Optional content: any other special military aerodrome procedure*

[1] Commission Regulation (EU) No 139/2014 of 12 February 2014 laying down requirements and administrative procedures related to aerodromes pursuant to Regulation (EC) No 216/2008 of the European Parliament and of the Council (OJ L 44, 14.2.2014, p. 1).

TOPIC LAWB 5 — RULES AND REGULATIONS			
BASIC LAWBMIL 5.~~7~~9.7	Describe the different VFR & IFR patterns.	2	VFR-patterns (jet pattern, conventional pattern, visual straight-in), IFR-patterns (Ground control approach, ILS, TACAN), etc.
Subtopic LAWB 5.~~8~~10 — Holding procedures for IFR flights			
BASIC LAWB 5.~~8~~10.1	Describe the purpose of holding.	2	Traffic management, weather, pilot request, ~~ICAO Doc 4444,~~ Regulation (EU) 2017/373, ICAO Doc 8168 *Optional content: ICAO Doc 4444*
BASIC LAWB 5.~~8~~10.2	Describe the types of holding patterns.	2	Published, non-published
BASIC LAWB 5.~~8~~10.3	Describe a military and 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) National military regulations and directives
BASIC LAWB 5.~~8~~10.4	Describe the factors, including specific to the military, affecting the holding pattern.	2	Effect of speed, effect of level used, effect of navigation aid in use, turbulence
Subtopic LAWB 5.~~9~~11 — Holding procedures for VFR flights			
BASIC LAWB 5.~~9~~11.1	~~Describe~~ Recognise VFR holding, including specific to the military.	~~2~~ 1	

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
BASIC ATMB 1.2.2	Explain the division of the ATC service.	2	Regulation (EC) No 549/2004, Regulation (EU) 2017/373 ~~*Optional content: ICAO Annex 11*~~ *Optional content: ICAO Annex 11*
BASIC ATMB 1.2.3	Explain the responsibility for the provision of the ATC service.	2	~~ICAO Annex 11~~ Regulation (EU) 2017/373, National military regulations and directives *Optional content: 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) and Military Radar Information Service (RIS)[1]			
BASIC ATMB 1.3.1	Define FIS and RIS.	1	Regulation (EU) No 923/2012 National military regulations and directives
BASIC ATMB 1.3.2	Describe the scope of the FIS and RIS.	2	Regulation (EU) No 923/2012 National military regulations and directives
BASIC ATMB 1.3.3	Explain the responsibility for the provision of the FIS and RIS.	2	Regulation (EU) No 923/2012, ~~ICAO Doc 4444~~ Regulation (EU) 2017/373 National military regulations and directives
BASIC ATMB 1.3.4	State the methods of transmitting information.	1	RTF, data link, ATIS, VOLMET ~~*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, Regulation (EU) 2017/373 ~~ICAO Annex 3~~ *Optional content: meteorological data obtained by data link, ICAO Annex 3*
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	Define ALRS.	1	Regulation (EU) No 923/2012

[1] Where applicable.

TOPIC ATMB 1 — AIR TRAFFIC MANAGEMENT			
1.4.1			
BASIC ATMB 1.4.2	Describe the scope of the ALRS.	2	Regulation (EU) No 923/2012, ICAO Annex 11
BASIC ATMB 1.4.3	Explain the responsibility for the provision of the ALRS.	2	~~ICAO Doc 4444,~~ Regulation (EU) 2017/373, Regulation (EU) No 923/2012 National military regulations and directives *Optional content: 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
BASIC ATMB 1.5.2	State ~~Describe~~ the scope of the air traffic advisory service.	~~2~~ 1	Regulation (EU) No 923/2012, ~~ICAO Doc 4444~~ Regulation (EU) 2017/373
BASIC ATMB 1.5.3	~~Explain~~ State the responsibility for the provision of the air traffic advisory service.	1 ~~2~~	Regulation (EU) No 923/2012, ~~ICAO Doc 4444~~ Regulation (EU) 2017/373
~~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
~~BASIC ATMB 1.6.2~~	~~State the scope of capacity management.~~	~~1~~	~~Regulation (EU) No 255/2010[1],~~ ~~Regulation (EU) 2019/123[2],~~ ~~ICAO Doc 4444~~
BASIC ATMB 1.6.~~3~~2	~~Describe~~ State the scope of air traffic flow and capacity management (ATFCM).	~~2~~ 1	Regulation (EU) No 255/2010, Regulation (EU) ~~No~~ 2019/123, ICAO Doc 4444, EUROCONTROL ATFCM Users Manual

[1] Commission Regulation (EU) No 255/2010 of 25 March 2010 laying down common rules on air traffic flow management (OJ L 80, 26.3.2010, p. 10).

[2] Commission Implementing Regulation (EU) 2019/123 of 24 January 2019 laying down detailed rules for the implementation of air traffic management (ATM) network functions and repealing Commission Regulation (EU) No 677/2011 (OJ L 28, 31.1.2019, p. 1).

TOPIC ATMB 1 — AIR TRAFFIC MANAGEMENT			
BASIC ATMB 1.6.~~4~~3	~~Explain~~ State the responsibility for the provision of ATFCM.	1 ~~2~~	Regulation (EU) No 255/2010, Regulation (EU) ~~No~~ 2019/123, ICAO Doc 4444, EUROCONTROL ATFCM Users Manual
BASIC ATMB 1.6.~~5~~4	List ~~Explain~~ the methods of providing ATFCM.	~~2~~ 1	Regulation (EU) No 255/2010, Regulation (EU) ~~No~~ 2019/123, ~~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 *Optional content: Regulation (EC) No 2150/2005*[1]
BASIC ATMB 1.7.2	Describe the scope of ASM.	2	Regulation (EC) No 2150/2005, Regulation (EU) 2019/123 *Optional content: FABs documents, 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, Regulation (EU) 2019/123, National military regulations and directives *Optional content: EUROCONTROL Specification for the application of the FUA*
BASIC ATMB 1.7.4	State ~~Explain~~ the methods of managing airspace.	~~2~~ 1	Regulation (EC) No 2150/2005, Regulation (EU) 2019/123, National military regulations and directives *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	Regulation (EU) No 923/2012, 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	Regulation (EU) No 923/2012, table of cruising levels
BASIC ATMB 2.3.2	Choose the appropriate levels.	3	Flight levels, altitudes, heights

[1] Commission Regulation (EC) No 2150/2005 of 23 December 2005 laying down common rules for the flexible use of airspace (OJ L 342, 24.12.2005, p. 20).

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	Regulation (EU) No 923/2012 NATO STANAGS National military regulations and directives ICAO Doc 4444 *Optional content: national civil documents*
BASIC ATMB 3.1.3	Perform communication effectively.	3	Regulation (EU) No 923/2012, c~~c~~ommunication 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 Doc 4444
BASIC ATMB 4.1.2	Describe the contents of an ATC clearance.	2	Regulation (EU) No 923/2012, ICAO Doc 4444
BASIC ATMB 4.1.3	Issue appropriate ATC clearances.	3	Regulation (EU) No 923/2012 *ICAO Doc 4444* *Optional content: ~~ICAO Doc 4444~~, national civil/military 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	Regulation (EU) No 923/2012, ICAO Doc 4444
BASIC ATMB 4.2.3	Issue appropriate ATC instructions.	3	Regulation (EU) No 923/2012, ICAO Doc 4444 *Optional content: national civil/military 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	Regulation (EU) No 923/2012, ICAO Doc 4444, ICAO Annex 11, National military regulations and directives *Optional content: notification, negotiation, agreement, transfer of flight data and local agreements, etc.*
BASIC ATMBM IL 5.1.2	Explain the coordination rules and procedure applied in case of renegade or aircraft interception.	2	Regulation (EU) 2017/373 National military regulations and directives
Subtopic ATMB 5.2 — Necessity for coordination			

TOPIC ATMB 5 — COORDINATION			
BASIC ATMB 5.2.1	Appreciate the need for coordination.	3	*Optional content: ICAO Doc 4444, Regulation (EU) No 923/2012, local procedures, letters of agreement*
BASIC ATMB 5.2.2	Differentiate between transfer of control and transfer of communication procedures.	2	Regulation (EU) 2017/373
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,~~ Regulation (EU) No 923/2012, Regulation (EU) 2017/373, National military regulations and directives *Optional content: ICAO Doc 4444*
BASIC ATMB 7.1.2	Explain the vertical separation procedures.	2	Regulation (EU) No 923/2012, Regulation (EU) 2017/373, National military regulations and directives ~~ICAO Doc 4444~~ *Optional content: 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	Regulation (EU) 2017/373, Regulation (EU) No 923/2012 ~~ICAO Doc 4444,~~ National military regulations and directives *Optional content: ICAO Doc 4444*
BASIC ATMB 7.2.2	State the principles of lateral separation procedures.	1	Regulation (EU) 2017/373, Regulation (EU) No 923/2012 ~~ICAO Doc 4444,~~ National military regulations and directives *Optional content: 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	National military regulations and directives
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 National military regulations and directives
BASIC ATMB 7.4.2	Explain the aerodrome separation procedures.	2	Regulation (EU) 2017/373, Regulation (EU) No 923/2012 ~~ICAO Doc 4444,~~ National military regulations and directives *Optional content: ICAO Doc 4444*
BASIC ATMB 7.4.3	Define essential local traffic.	1	Regulation (EU) 2017/373 ~~ICAO Doc 4444,~~ National military regulations and directives
BASIC ATMBM IL 7.4.5	Define aerodrome separation for specific military activities.	1	standard/ not standard, formation flight *Optional content: EUROCONTROL EUROAT*
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, National military regulations and directives *Optional content: ICAO Doc 4444*
BASIC ATMB 7.5.2	Explain the ATS surveillance systems separation standards and procedures.	2	Regulation (EU) 2017/373 ~~ICAO Doc 4444,~~ National military regulations and directives *Optional content: ICAO Doc 4444*
BASIC ATMB 7.5.3	Explain the methods and procedures for establishing identification.	2	Regulation (EU) 2017/373, National military regulations and directives *Optional content: ICAO Doc 4444*
BASIC ATMBM IL 7.5.4	Define ATS separation for specific military activities.	1	Air-to-air refuelling, formation flight National military regulations and directives
Subtopic ATMB 7.6 — Wake turbulence separation			
BASIC ATMB 7.6.1	Explain the wake turbulence separations.	2	~~ICAO Doc 4444,~~ Regulation (EU) No 923/2012, Regulation (EU) 2017/373 *Optional content: EASA SIB 2017-10 'En-route Wake Turbulence Encounters'*
TOPIC ATMB 8 — AIRBORNE ~~COLLISION AVOIDANCE SYSTEMS~~ AND GROUND-BASED SAFETY NETS			
Subtopic ATMB 8.1 — Airborne safety nets ~~collision avoidance systems~~			
BASIC ATMB 8.1.1	State the European Union requirement for carriage of airborne collision avoidance system.	1	Regulation (EU) No 1332/2011[1]
BASIC ATMB 8.1.2	Explain the main characteristics of airborne safety nets ~~warning systems~~ and their relevance to ATC operations.	2	ACAS, TAWS, Military aircraft equipment *Optional content: TCAS, EGPWS, wind shear alerts*

[1] Commission Regulation (EU) No 1332/2011 of 16 December 2011 laying down common airspace usage requirements and operating procedures for airborne collision avoidance (OJ L 336, 20.12.2011, p. 20).

TOPIC ATMB 8 — AIRBORNE ~~COLLISION AVOIDANCE SYSTEMS~~ AND GROUND-BASED SAFETY NETS			
BASIC ATMB 8.1.3	Explain the function of ACAS Traffic Alerts and Resolution Advisories.	2	Regulation (EU) No 1332/2011, ICAO Doc 8168 *Optional content: ~~EUROCONTROL ACAS web page~~ Skybrary Safety Nets*
BASIC ATMB 8.1.4	List the actions of the pilot in case of TA and RA.	1	Regulation (EU) No 923/2012, ICAO Doc 9863 ~~Regulation (EU) No 1332/2011, ICAO Doc 8168~~
BASIC ATMB 8.1.5	List the ACAS limitations.	1	ICAO Doc 9863 *Optional content: ~~EUROCONTROL ACAS web page~~ Skybrary Safety Nets*
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	Military ground equipment *Optional content: STCA, MSAW, APW, APM, Skybrary Safety Nets*

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	

TOPIC ATMB 9 — BASIC PRACTICAL SKILLS			
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~~1	Apply the procedures for establishing identification.	3	Any of the ATS surveillance systems identification methods
BASIC ATMB 9.4.~~3~~2	Estimate the heading for a new track and the distance to the next waypoint.	3	
BASIC ATMB 9.4.43	Apply vectoring techniques.	3	
BASIC ATMB 9.4.~~5~~4	Conduct level changes.	3	*Optional content: cruising level allocation, requested level change, climb/descent to exit level, descent to an altitude or a height*
BASIC ATMB MIL 9.4.5	Perform the control of traffic by using surveillance equipment.	3	Approach and Area Control *Optional: Aerodrome control*

TOPIC ATMBMIL 10 — MILITARY (CONTROL) SERVICE			
Subtopic ATMBMIL 10.1 — Diversions and capacity status			
BASIC ATMBMIL 10.1.1	Define diversion and landing capacity.	1	
BASIC ATMBMIL 10.1.2	Differentiate between airfield status.	2	*Optional content: standby, alternate and diversion airfield*
Subtopic ATMBMIL 10.2 — Aerobatic flights			
BASIC ATMB 10.2.1	Explain aerobatic flights.		

Sub-topic ATMBMIL 10.3 – Operation of RPAS			
BASIC	Explain the specificities of RPAS operations.	2	National civil and military regulations and directives

Sub-topic ATMBMIL 10.3 – Operation of RPAS			
ATMBMIL 10.3.1			*Optional content: U-Space*
Sub-topic ATMBMIL 10.4 – Mission effectiveness			
BASIC ATMBMIL 10.4.1	List the consequences of ATC changes on mission effectiveness of a Military Aircraft Operation.	1	Time over target (TOT), fuel limitations

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	Recognise ~~Explain~~ the relevance of meteorology in aviation.	~~2~~ 1	
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	Regulation (EU) 2017/373 Regulation (EU) 923/2012 SERA Section 12 and Appendix 5 *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 *Optional content: space weather*
Subtopic METB 1.3 — Organisation of meteorological service			
BASIC METB 1.3.1	State ~~Name~~ the basic duties~~, organisation and working methods~~ of meteorological offices.	1	*Optional content: WAFS, WAFC, MWO, VAAC, TCAC, SADIS, aerodrome meteorological office, aeronautical meteorological station*
BASIC METB 1.3.2	State the international and national standards for coordination between ATS and MET services.	1	Regulation (EU) 2017/373 *Optional content: ICAO Annex 3*

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	

TOPIC METB 2 — ATMOSPHERE			
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	*Optional content: Nonadiabatic processes, cooling processes, horizontal heat transfer by advection*
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, QNE, 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, intertropical convergence zone, westerly winds, upper-level jet streams*
Subtopic METB 3.2 — Air masses and frontal systems			
BASIC METB 3.2.1	State ~~Describe the origin and movement of~~ typical air masses ~~and their general effect on~~ relevant to European weather.	~~2~~ 1	~~Polar, arctic, tropical, equatorial (maritime and continental)~~ *Optional content: Polar, arctic, tropical, equatorial (maritime and continental)*
BASIC METB 3.2.2	Recognise ~~Describe~~ the main isobaric features.	~~2~~ 1	~~Cyclones, anticyclones, ridge, trough~~ *Optional content: Cyclones, anticyclones*
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	Recognise ~~Describe~~ the main phenomena caused by mesoscale systems.	~~2~~ 1	Mountain waves, ~~Föhn, slope and~~ valley winds, thunderstorm, squall line

TOPIC METB 3 — ATMOSPHERIC CIRCULATION			
			Optional content: land/sea breezes, tornadoes, land spouts, waterspouts, Föhn, slope winds
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 the means by which ~~how~~ wind is measured.	1	Anemometer, wind sock *Optional content: wind sensor, Beaufort scale, etc.*
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~~2	State the different cloud types~~'~~ and their main characteristics.	1	
BASIC METB 4.1.43	State how the cloud base and the amount of cloud are measured and/or observed.	1	
BASIC METB 4.1.~~5~~4	Define cloud base and ceiling.	1	
BASIC METB 4.1.~~6~~5	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, freezing precipitations*
Subtopic METB 4.3 — Visibility			
BASIC METB 4.3.1	Explain the causes of atmospheric obscurity.	2	*Optional content: Advection fog, radiation fog, mist, drizzle, precipitations, smoke, haze*
BASIC METB 4.3.2	Differentiate between different types of visibility.	2	Horizontal visibility, slant visibility, prevailing visibility, RVR

TOPIC METB 4 — METEOROLOGICAL PHENOMENA			
BASIC METB 4.3.3	State the means by which ~~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, space weather*
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 and warnings, in flight weather reports, tower observations*
BASIC METBMIL 5.1.2	Differentiate between the different military airfield meteorological colour codes.	2	

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	Metrics, imperial, coordinates reference formats
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	Form, size, rotation, revolution in space, seasons, day, night, twilight, units of time, time zones, UTC ~~*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	Latitude/longitude, degrees, minutes, seconds ~~*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	Latitude/longitude ~~*Optional content: latitude/longitude*~~
~~BASIC NAVB 2.2.4~~	~~Estimate distance and direction between two points.~~	~~3~~	
BASIC NAVB 2.2.5~~4~~	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**~~

TOPIC NAVB 3 — MAPS AND AERONAUTICAL CHARTS			
~~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~~1 — Maps and charts used in aviation			
BASIC NAVB 3.~~2~~1.1	~~Differentiate between~~ List the various maps and charts.	1 ~~2~~	National Military and Civilian Charts AIP
BASIC NAVB 3.~~2~~1.2	~~State~~ Explain the specific use of various maps and charts.	2 ~~1~~	National Military and Civilian Charts AIP
BASIC NAVB 3.~~2~~1.3	Decode symbols and information displayed on maps and charts.	3	*Optional content: chart scale, topographical features, NAV aids, fixes, fly over and fly by waypoints, display of true North, magnetic North, variation 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~~ Explain the cases where visual navigation is ~~primarily~~ used in military or commercial aviation.	2 ~~1~~	Approach and landing, taxiing, low level flights, air-to-air refuelling *Optional content: visual aids (e.g., night vision goggles)*
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, alternate aerodrome, orography, 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, TACAN, PAR *Optional content: VDF, NDB,*
BASIC NAVB 5.1.2	State the use of ground-based systems.	1	~~VDF, NDB,~~ VOR, DME, ILS, TACAN, PAR *Optional content: VDF, NDB,*
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, TACAN, PAR ~~*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	*Optional content: 2D/3D operations*
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 instrument~~al~~ 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 used in Europe.	1	RNAV 5, RNAV 1, RNP 1 with RF, RNP 0.3, RNP APCH *Optional content: PCP (Regulation (EU) No 716/2014[1])* *(AF #1, AF #3), PBN(Regulation (EU) 2018/1048)[2]*

[1] Commission Implementing Regulation (EU) No 716/2014 of 27 June 2014 on the establishment of the Pilot Common Project supporting the implementation of the European Air Traffic Management Master Plan (OJ L 190, 28.6.2014, p. 19).

[2] Commission Implementing Regulation (EU) 2018/1048 of 18 July 2018 laying down airspace usage requirements and operating procedures concerning performance-based navigation (OJ L 189, 26.7.2018, p. 3).

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	*Optional content: centre of gravity, fuel load, cargo load, external load,* *Regulation (EU) 1178/2011*
BASIC ACFTB 2.2.4	List aircraft design features reducing induced drag.	1	*Optional content: winglet, tip tanks, reducing wing incidence, aspect ratio, etc.*
BASIC ACFTB 2.2.5	Explain aircraft lights and their functions.	2	Regulation (EU) No 923/2012, ICAO Annex 6 *Optional content: Position lights, anti-collision lights, taxi light, navigation lights, stroboscopic lights, landing lights*
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	Explain~~List~~ the different categories of aircraft.	2 ~~1~~	Fixed wing, rotary wing, balloon, glider, RPAS

TOPIC ACFTB 3 — AIRCRAFT CATEGORIES			
Subtopic ACFTB 3.2 — Wake turbulence categories			
BASIC ACFTB 3.2.1	List the wake turbulence categories.	1	~~ICAO Doc 4444~~ Regulation (EU) 2017/373
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 *Optional content:* *https://www.easa.europa.eu/eaer/topics/technology-and-design/aircraft-noise*

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	After-burner
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 — Electric engines			
BASIC ACFTB 5.4.1	Explain the operating principles, advantages and disadvantages of the electric engine.	2	
Subtopic ACFTB 5.~~4~~5 — Sources of energy used in aviation ~~Aviation fuels~~			
BASIC ACFTB 5.5~~4~~.1	List the ~~most common~~ sources of energy used in aviation propulsion systems ~~fuels~~.	1	Petroleum-based fuels (Avgas, Jet A-1, Jet B, Biokerosene), electrical energy stored or generated on board of aircraft

TOPIC ACFTB 5 — AIRCRAFT ENGINES			
			Optional content: hydrogen cell, JP4, JP8

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, battery resource*
Subtopic ACFTB 6.4 — Aircraft elements and 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~~, cabin pressurisation, fire detection and extinguishing, emergency oxygen supply systems, head-up display*Optional content: ADS capability, ~~head-up display~~, wind shear indicator, weather radar, hydraulic system, electrical system, environmental system, helmet-mounted display*
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, EPU activation*
BASIC ACFTB 6.4.3	Explain common aircraft elements and their functions.	2	Aircraft cabin, flight deck, galley, doors, cargo compartments, dragchute, hook, ejection seat

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	Explain the factors affecting aircraft during cruise.	2	Level, cruising speed, wind, mass, cabin pressurisation

TOPIC ACFTB 7 — FACTORS AFFECTING AIRCRAFT PERFORMANCE			
7.3.1			
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	Statethe benefits of continuous descent operations.	1	
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	List the economic consequences of ATC changes on the flight profile of an aircraft.	1	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, 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 PERFORMANCE ~~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~~1 — Relevance of human factors for ATC			
BASIC HUMB 1.~~3~~1.1	Define human factors.	1	~~*Optional content: ICAO Human Factors Training Manual*~~
BASIC HUMB 1.1.2	Define human performance.	1	
BASIC HUMB 1.~~2.1~~.1.3	Explain the relevance ~~and importance~~ of human factors in ATM.	2	Historical background, safety impact on ATM, licensing requirements, incidents
BASIC HUMB 1.~~3.2~~1.4	Recognise the evolution of human performance during an ATCO's career. ~~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~~ Regulation (EU) 2015/340, experience, initial, unit, continuation and development training*
~~Subtopic HUMB 1.3 — Human factors and ATC~~			
~~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 — HEALTH AND WELL-BEING			
Subtopic HUMB 2.1 — Fitness for duty			
BASIC HUMB 2.1.1	Recognise the effect of health and well-being on fitness for duty.	1	

TOPIC HUMB 2 — HEALTH AND WELL-BEING			
BASIC HUMB 2.1.2	List the reasons for provisional inability to exercise the privileges of the ATCO licence.	1	Regulation (EU) 2015/340
BASIC HUMB 2.1.3	Recognise signs of lack of personal fitness.	1	Cognitive and physical fitness
BASIC HUMB 2.1.4	Describe good practices that contribute to maintaining fitness for duty.	2	*Optional content: fitness, diet*
Subtopic HUMB 2.2 — Stress and fatigue			
BASIC HUMB 2.2.1 ~~2.6.1~~	Define stress.	1	Regulation (EU) 2017/373~~Stress definition~~ ~~*Optional content: EATCHIP Human Factors Module — Stress*~~
BASIC HUMB 2.2.2	Define fatigue.	1	Regulation (EU) 2017/373
BASIC HUMB 2.2.3	Differentiate between stress and fatigue.	2	ICAO Doc 9966
BASIC HUMB 2.2.4	Explain the causal factors of stress and fatigue.	2	*Optional content: EUROCONTROL Fatigue and sleep management*
Subtopic HUMB 2.3 — Substance use and responsibility			
BASIC HUMB 2.3.1	Define psychoactive substance.	1	Regulation (EU) 2017/373
BASIC HUMB 2.3.2	Explain the effect of psychoactive substance use on the individual and on safety.	2	
BASIC HUMB 2.3.3	Describe individual responsibility in terms of psychoactive substance use.	2	Regulation (EU) 2017/373

TOPIC HUMB ~~2~~3 — HUMAN PERFORMANCE			
Subtopic HUMB ~~2~~3.1 — Individual behaviour			
BASIC HUMB 3.1.1	Define human behaviour.	1	
BASIC HUMB ~~2.1.1~~ 3.1.2	Explain the differences and commonalities that exist ~~among~~ between people.	2	*Optional content: attitude, cultural, language, motivation*
BASIC HUMB 3.1.3	Describe the reasons for complacency and the associated effects.	2	Safety, working relationship – team
BASIC HUMB ~~2.1.3~~ 3.1.4	Describe ~~Explain~~ the reasons for ~~dangers of~~ overconfidence and the associated effects. ~~complacency.~~	2	Safety, working relationship – team

TOPIC HUMB ~~2~~3 — HUMAN PERFORMANCE			
BASIC HUMB ~~2.1.2~~ 3.1.5	Explain the dangers of boredom.	2	
~~BASIC HUMB 2.1.4~~	~~Explain the dangers of fatigue.~~	~~2~~	~~Sleep disturbance, heavy workload~~
Subtopic HUMB ~~2~~3.2 — Safety culture and professional conduct			
BASIC HUMB 3.2.1	Recognise professional conduct in the work place.	1	*Optional content: Professionalism, attitude, communication, teamwork*
BASIC HUMB ~~2.2.1~~ 3.2.2	Describe ~~Characterise the role of~~ how the air traffic controller contributes to a ~~for~~ positive safety culture.	2	*Optional content: attitude towards safety, punctuality, rigour, adherence to rules and regulations, teamwork attitude, etc.*
BASIC HUMB 3.2.3	Consider the factors which influence responsible behaviour.	2	*Optional content: situation, team, personal situation and judgement, instance of justification, moral motivation, personality*
~~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 2.4.4~~	~~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*~~

TOPIC HUMB ~~2~~3 — HUMAN PERFORMANCE			
~~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~~4 — 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~~ 4.1 — Definition of human error			
BASIC HUMB ~~3.2.1~~ 4.1.1	Define human error.	1	
Subtopic HUMB ~~3.3~~ 4.2 — Classification of human error			
BASIC HUMB ~~3.3.1~~ 4.2.1	List ~~State~~ the types of errors.	1	*Optional content: slips, lapses, mistakes*
BASIC HUMB ~~3.2.2~~ 4.2.2	Describe ~~the~~ factors ~~which~~ contributeing to the occurrence of different types of ~~cause~~ errors and how these may be reduced.	2	Fatigue, lack of skill, misunderstanding, multitasking, lack of information, distraction, lack of work satisfaction
BASIC HUMB ~~3.3.2~~ 4.2.3	Define violations.	1	
BASIC HUMB ~~3.3.3~~ 4.2.4	Differentiate between errors and violations of rules and their consequences for the controller.	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 5 — TEAMWORK			
Subtopic HUMB 5.1 — Teamwork and team roles			
BASIC HUMB 5.1.1	Define teamwork.	1	
BASIC HUMB ~~2.4.1~~ 5.1.2	Describe the differences between social human relations and professional interactions.	2	
BASIC HUMB 5.1.3	Explain the different types of teams in the ATC environment.	2	*Optional content: executive/planner, shift team, sector group or ATC unit team, team with pilots, team with adjacent ATC units*
BASIC HUMB ~~2.4.2~~ 5.1.4	Recognise ~~Describe~~ the different types, roles and characters in a team	~~2~~ 1	~~*Optional content: leader, follower*~~
BASIC HUMB ~~2.4.3~~ 5.1.5	Characterise ~~Appreciate~~ the principles of teamwork.	~~3~~ 2	*Optional content: team membership, team roles, group dynamics, advantages/disadvantages of teamwork, conflicts and their solutions*

TOPIC HUMB ~~4~~6 — 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~~ 6.1 — ~~Communication process~~ Communications in ATC			
BASIC HUMB ~~4.2.1~~ 6.1.1	Define communication.	1	
BASIC HUMB 6.1.2	List an ATCO's communication partners.	1	
BASIC HUMB 6.1.3 ~~4.3.3~~	Explain ~~Apply~~ good communication practices.	2	Speaking and listening
BASIC HUMB 6.1.4	Differentiate between hearing and listening.	2	
~~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~~ 6.2 — Communication modes			
BASIC HUMB ~~4.3.1~~ 6.2.1	Describe the factors which affect verbal communication.	2	*Optional content: word choice, intonation, speed, tone, distortion, load, expectation, noise, interruption, language competence ~~knowledge (i.e. accent, dialect, vocabulary)~~*
BASIC HUMB ~~4.3.2~~ 6.2.2	Describe the factors which affect non-verbal communication.	2	*Optional content: touch, choice, expectation, noise, interruption*

TOPIC HUMB 46 — COMMUNICATION			
BASIC HUMB 6.2.3	Describe misunderstandings that may arise during a controller's communication.	2	

~~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~~1	Describe the characteristics of radio waves.	2	Propagation, limitations *Optional content: interferences, jamming*
BASIC EQPSB 2.1.~~3~~2	State the use, characteristics and limitations of frequency bands.	1	Use in ATC, communication, navigation, and surveillance, use and application in the Aeronautical Mobile Service~~, HF, VHF, UHF~~ *Optional content: HF, VHF, UHF*
BASIC EQPSB 2.1.~~4~~3	State the different uses of radio wave spectrum.	1	
BASIC EQPSBMIL 2.1.4	Define NATO frequencies.	1	
BASIC EQPSBMIL 2.1.5	Describe Air Defence radio procedures.	2	
Subtopic EQPSB 2.2 — Direction finding			
BASIC EQPSB 2.2.1	State the principles and use of VDF/UDF.	1	VDF/UDF, QDM, QDR, QTE ~~QTF~~ *Optional content: precision of VDF/UDF used in the State system*
~~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	

TOPIC EQPSB 3 — COMMUNICATION EQUIPMENT			
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 and others			
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 ~~C~~controller ~~P~~pilot ~~D~~data Llink ~~C~~communications (CPDLC).	2	
BASIC EQPSB 3.3.2	~~Explain~~ State the use and list the benefits of aircraft communications addressing and reporting system (ACARS).	1 ~~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, Mode S
BASIC EQPSB 5.3.2	Explain SSR code management	2	Discrete, non-discrete codes, special codes

TOPIC EQPSB 5 — RADAR			
BASIC EQPSB 5.3.3	Explain the effect of antenna shadowing on SSR operation.	2	Clutter, garbling, fade, MTI
Subtopic EQPSB 5.4 — Use of radars			
BASIC EQPSB 5.4.1	Explain the use of PSR/SSR in area, approach and aerodrome control. ~~ATC.~~	2	Mode A, Mode C, Mode S, SMR, Military modes and codes ~~Area, approach, aerodrome, surface movement radar, DFTI~~ *Optional content: 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~~ List the working principles of ADS.	~~2~~ 1	
Subtopic EQPSB 6.2 — Use of automatic dependent surveillance			
BASIC EQPSB 6.2.1	~~Describe~~ State the use of ADS in ATC.	~~2~~ ~~1~~	Area, approach, aerodrome, ICAO Doc 4444
BASIC EQPSB 6.2.2	~~Explain~~ List the limitations of ADS.	~~2~~ 1	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~~ Define the working principles of MLAT.	~~2~~ 1	*Optional content: passive and active MLAT*
Subtopic EQPSB 7.2 — Use of multilateration			
BASIC EQPSB 7.2.1	~~Describe~~ Define the use of MLAT in ATC.	~~2~~ 1	Area, approach, aerodrome
BASIC EQPSB 7.2.2	~~Explain~~ List the limitations of MLAT.	~~2~~ 1	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	State ~~Explain~~ the working principles of surveillance data processing.	~~2~~ 1	~~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*
Subtopic EQPSB 8.3 — Flight data processing			
BASIC EQPSB 8.3.1	Explain the FDPS core functions.	2	*Optional content: System flight plan, data input, SSR code management, coordination, correlation/decorrelation etc.*

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~~ List the principles of automation in communication and data links in ATS.	~~2~~ 1	
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~~ List the benefits of automatic exchange of ATS data in coordination and transfer processes.	~~2~~ 1	Accuracy, speed and safety, non-verbal communication
BASIC EQPSB 10.3.2	~~Describe~~ List the limitations of automatic exchange of ATS data in coordination.	1	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~~ State the use of ATIS and VOLMET in ATS.	1 ~~2~~	Regulation (EU) No 923/2012, 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 and wing 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 aviation			
BASIC PENB 2.2.1	Describe airspace usage by ~~the~~ military aircraft.	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~~ ATS as a service provider			
BASIC PENB 3.1.1	State the role of ATS ~~ATC~~ as a service provider.	1	*Optional content: Skybrary – Air Traffic Service, Service Rules and Regulations, National military and civil regulation.*
BASIC PENB 3.1.2	Recognise the means by which ATS providers are ~~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~~ Define the role of ATS ~~ATC~~ in the concept of sustainable development.	~~2~~ ~~1~~	*Optional content: ICAO Annex 16*

TOPIC PENB 4 — ENVIRONMENTAL PROTECTION			
BASIC PENB 4.1.3	State how the impact of aviation on the environment can be mitigated by ANSPs. ~~State how to measure, monitor and mitigate the impact aviation hsas on the environment.~~	1	*Optional content: EU ETS, SES initiative, EUROCONTROL role, continuous descent operations (CDOs), continuous climb operations (CCO), collaborative environmental management (CEM), noise-abatement procedures*