FIR Flight Information Service Surveillance Rating with Radar Endorsement

FFS/RAD

Module 14

BLANK

TABLE OF CONTENTS

BLANK

EXECUTIVE SUMMARY

Phase II – Rating and endorsement specialised training Module 14 provides the Common Core Content for **FIR Flight Information Service Surveillance Rating with Radar Endorsement** training.

The content of the rating training course is based on the assumption that the student has successfully completed the Phase I – Basic ATS Training, Common Core Content Objectives as a prerequisite.
It has been derived by building on the Phase I Basic ATS Training Common Core Content. A copy of this, together with a list of action verbs used, are contained the Danish CAA ATS Initial Training – BASIC ATS TRAINING.

Following the tabulated format of the Phase I Common Core Content, the **FIR Flight Information Service Surveillance Rating with Radar Endorsement** training common core content has been subdivided into subjects:

1. Introduction to the Course (INTR);
2. Aviation Law (LAW);
3. Air Traffic Management (ATM);
4. Meteorology (MET);
5. Navigation (NAV);
6. Aircraft (ACFT);
7. Human Factors (HUM);
8. Equipment and Systems (EQPM);
9. Professional Environment (PENV);
10. Unusual/Emergency Situations (UNES);
11. Degraded Systems Capability (DEGS);
12. Aerodromes (AGA).

The order of the subjects and objectives is neither intended to convey a pedagogical sequence nor to indicate a relative level of importance.

The training designer will need to know that the student has successfully completed the Phase I Course. The design of **the FIR Flight Information Service Surveillance Rating with Radar Endorsement** Course can now be based on the combination of Phase I and Phase II – Rating and endorsement specialised training Module 14.

Minimum time spend

Lecturing	60 hours *
Simulator training	20 hours per student *

* if converting/extending from ATC to FIS licence the required lecturing time may be halved and the required simulator time may be reduced subject to the CTI assessment but not less than 75%.

Examination/Assessment
Summative assessment in the simulator.
Daily logs on debriefing.
Assessment report for every 5 hours.

Theoretical test:

Time available	60 mins
Questions	40
Pass mark	75%

Facilities English - Danish dictionary

Distribution of Questions:

CQB Module 14	Amount of questions
Subject 01	
14 01 01 01	
14 01 01 02	
14 01 01 03	
14 01 02 01	
14 01 02 02	
14 01 02 03	
Total Subject 01	0

Subject 02	
14 02 01 01	
14 02 01 02	
14 02 01 03	
14 02 01 04	
14 02 01 05	
14 02 01 06	
14 02 01 07	
14 02 02 01	
14 02 03 01	
14 02 03 02	
Total Subject 02	6

Subject 03	
14 03 01 01	
14 03 01 02	
14 03 01 03	
14 03 01 04	
14 03 02 01	
14 03 02 02	
14 03 02 03	
14 03 03 01	
14 03 03 02	
14 03 03 03	
14 03 03 04	
14 03 04 01	
14 03 04 02	
14 03 04 03	
14 03 04 04	
14 03 05 01	
14 03 05 02	
14 03 05 03	

CQB Module 14	Amount of questions
14 03 06 01	
14 03 07 01	
14 03 07 02	
14 03 08 01	
14 03 08 02	
14 03 09 01	
14 03 09 02	
14 03 10 01	
14 03 10 02	
14 03 11 01	
14 03 11 02	
14 03 11 03	
14 03 11 04	
14 03 11 05	
14 03 11 06	
14 03 12 01	
14 03 12 02	
14 03 13 01	
14 03 13 02	
Total Subject 03	12

Subject 04	
14 04 01 01	
14 04 02 01	
14 04 02 02	
14 04 02 03	
14 04 02 04	
Total Subject 04	2

Subject 05	
14 05 01 01	
14 05 01 02	
14 05 01 03	
14 05 01 04	
14 05 01 05	
14 05 01 06	
Total Subject 05	3

CQB Module 14	Amount of questions
Subject 06	
14 06 01 01	
14 06 02 01	
14 06 02 02	
14 06 03 01	
14 06 03 02	
14 06 03 03	
14 06 03 04	
14 06 03 05	
14 06 04 01	
Total Subject 06	5

Subject 07	
14 07 01 01	
14 07 02 01	
14 07 02 02	
14 07 03 01	
14 07 03 02	
14 07 03 03	
14 07 04 01	
14 07 04 02	
14 07 05 01	
14 07 05 02	
14 07 05 03	
14 07 06 01	
14 07 07 01	
14 07 08 01	
Total Subject 07	5

Subject 08	
14 08 01 01	
14 08 01 02	
14 08 02 01	
14 08 02 02	
14 08 02 03	
14 08 03 01	
14 08 04 01	
14 08 04 02	
14 08 05 01	
14 08 06 01	
14 08 06 02	
14 08 07 01	
14 08 07 02	
14 08 07 03	
14 08 08 01	
Total Subject 08	3

CQB Module 14	Amount of questions
Subject 09	
14 09 01 01	
14 09 01 02	
14 09 01 03	
Total Subject 09	0

Subject 10	
14 10 01 01	
14 10 01 02	
14 10 01 03	
14 10 01 04	
14 10 01 05	
14 10 01 06	
14 10 01 07	
Total Subject 10	2

Subject 11	
14 11 01 01	
14 11 01 02	
14 11 01 03	
14 11 02 01	
14 11 03 01	
14 11 04 01	
Total Subject 11	2

Subject 12	
Not applicable	
Total Subject 12	0

Total module 14	40

BLANK

SUBJECT 1: INTRODUCTION TO THE COURSE

The general objective is:
Students shall know and understand the training programme that they will follow during the institutional rating training.

TOPIC / SUBTOPIC	**OBJECTIVES** Students shall	**L**	**CONTENT**
1. COURSE MANAGEMENT Students shall explain the aims and objectives of the course, the management structure and recognise the materials to be used.			
1.1. Course Introduction	1.1.1. Explain the aims and main objectives of the course	2	Course objectives for the specific rating/endorsement
1.2. Course Administration	1.2.1. Name the course leader and principal instructors	1	
1.3. Study Material and Training Documentation	1.3.1. Choose appropriate documentation for course studies	3	Library; CBT library
	1.3.2. Integrate appropriate documentation into the course	4	Library; CBT library
2. INTRODUCTION TO THE ATC TRAINING COURSE Students shall state the methodology and describe the assessment procedures used in the course.			
2.1. Course Content	2.1.1. State the different methods of teaching the subjects	1	Theoretical training; Practical training; Self-study; taxonomy; Action verbs
	2.1.2. Describe, in general terms, the content of the subjects	2	
	2.1.3. Describe the organisation of the theoretical training	2	
	2.1.4. Describe the organisation of the simulation training	2	Structure of participation; Simulation exercises; Briefing; Debriefing
2.2. Training Ethos	2.2.1. Recognise the feedback mechanisms available	1	Instructor discussions; Training progress; Assessment; Results; Briefing; Debriefing
	2.2.2. Describe the positive effect in working together with fellow course participants	2	How the influence of Interactive studies can lead to success
2.3. The Assessment Process	2.3.1. Describe the assessment procedure	2	The assessment process applied during the course and associated re-sit procedures

BLANK

SUBJECT 2: AVIATION LAW

The general objective is:
Students shall:
i. appreciate the principles of Aviation Law;
ii. apply the regulations governing Rules of the Air; airspace and flight planning;
iii. appreciate the authority vested in the controller and the means by which that authority is exercised.

TOPIC / SUBTOPIC	**OBJECTIVES** Students shall	**L**	**CONTENT**
1. RULES AND REGULATIONS Students shall explain and apply the Rules and Regulations which affect ATC operations.			
1.1. General	1.1.1. Differentiate between the Air Navigation Services	2	ICAO Doc 9161- ATM (ATS, ATFM, ASM).
	1.1.2. Explain the considerations which determine the need for the Air Traffic Services (ATS)	2	ANNEX 11 Chapter 2
	1.1.3. Differentiate between the ATS	2	ATC service; Advisory service; FIS; Alerting service
1.2. Reports	1.2.1. State the standard forms for reports	1	e.g. Incident/Accident; Airmiss/ Airprox; Breach of Regulations; Watch/ Log book; Records
	1.2.2. Describe the functions of, and processes for, reporting	2	e.g. Incident/Accident; Airmiss/ Airprox; Breach of Regulations; Watch/ Log book; Records
	1.2.3. Use the standard forms for reporting	3	ICAO Doc 4444 Appendix 4; Breach of regulations; Other
	1.2.4. Explain the use of air traffic incident/accident report form	2	ICAO Doc 4444 Part II; national regulations
	1.2.5. Use the ICAO air traffic incident/accident report form	3	ICAO Doc 4444 Appendix 4
	1.2.6. Use the national air traffic incident/accident report form	3	

TOPIC / SUBTOPIC	**OBJECTIVES** Students shall	**L**	**CONTENT**
1.3. Airspace	1.3.1. Appreciate types of airspace and their relevance to FFS/RAD	3	Classes A - G as appropriate; National classifications
	1.3.2. Provide planning, co-ordination and actions appropriate to the airspace classification	4	ICAO ANNEX 11; National requirements (AIP); International Requirements; Civil Requirements; Military requirements; Areas of responsibility; Sectorisation; Airspace structure Note: The simulated environment must be related to the specific rating and take account of the local airspace classification requirements.
	1.3.3. Appreciate the structure of airspace and its relevance to the FFS/RAD rating	3	ICAO ANNEX 11; National requirements (AIP); International Requirements; Civil requirements; Military requirements; Areas of responsibility; Sectorisation; Airspace structure
	1.3.4. Provide planning, co-ordination and actions appropriate to the airspace structure	4	ICAO ANNEX 11; National requirements (AIP); International Requirements; Civil requirements; Military requirements; Areas of responsibility; Sectorisation; Airspace structure Note: The simulated environment must be related to the specific rating and take account of the local airspace structure requirements
1.4. Rules of the Air	1.4.1. Provide planning, co-ordination and information actions appropriate to the General Rules	4	ICAO ANNEX 2 Chapter 3 Note: The simulated environment must be related to the specific rating and take account of the appropriate rules
	1.4.2. Provide planning, co-ordination and information actions appropriate to the VFR, IFR, and meteorological flying conditions	4	ICAO ANNEX 11 Chapters 4 and 5 Note: The simulated environment must be related to the specific rating and take account of the appropriate rules
	1.4.3. Provide planning, co-ordination and information actions appropriate to the rules for minimum safe height and terrain clearance	4	Responsibility for terrain clearance; Terrain clearance dimensions; Minimum safe altitudes; Safe sectors; Transition level; Minimum flight level

TOPIC / SUBTOPIC	**OBJECTIVES** Students shall	**L**	**CONTENT**
1.5. Flight Plans	1.5.1. Obtain flight plan information in order to provide ATS	3	Types of FPL (RPL, AFIL, etc.); Supplementary information
	1.5.2. Use flight plan information in order to provide ATS	3	Types of FPL (RPL, AFIL, etc.); Supplementary information
	1.5.3 Appreciate the pilot's responsibilities in relation to adherence to flight plan	3	Inadvertent changes; Intended changes; Position reporting
1.6. National Legislation and Procedures	1.6.1. Describe the methods by which national Regulations are implemented in the FFS/RAD rating	2	
1.7. Special National Legislation and Procedures	1.7.1. Provide planning, co-ordination and information actions in accordance with special national legislation and procedures	4	e.g. Security; Environmental (noise abatement; Conservation areas fuel jettisoning); Sensitive areas (hospitals; VIP residences); Priority allocation; Special purpose codes
2. HOLDING Students shall appreciate holding patterns and procedures			
2.1. Holding IFR	2.1.1. Describe types of holding patterns	2	Published; non-published; Extended
	2.1.2. Describe a ICAO holding pattern	2	Parts of an IFR holding pattern; Entry/exit procedures; Dimensions of patterns; Protected airspace; Holding areas; Alignment; Rates of turns; Holding times; Onward clearance time; Expected approach times (EATs)
	2.1.3. Describe the use and purpose of holding	2	Effect of speed; Effect of level used; Effect of navigation aid in use
3. FIS LICENSING Students shall appreciate the legal aspects associated with the FIS Licence			
3.1. Privileges and Conditions	3.1.1. Describe the conditions which must be met for the issue and maintenance of the ACS/RAD rating	2	
	3.1.2. Describe the privileges associated with the ACS/RAD rating	2	
3.2. Incident/Accident	3.2.1. Explain the procedures used following an incident/accident	2	National regulations

BLANK

SUBJECT 3: AIR TRAFFIC MANAGEMENT

The general objective is:
Students shall apply operational procedures to ensure a safe, orderly and expeditious service.

TOPIC / SUBTOPIC	**OBJECTIVES** Students shall	**L**	**CONTENT**
1. AIR TRAFFIC SERVICES AND AIRSPACE MANAGEMENT Students shall provide the appropriate service.			
1.1. Flight Information Service (FIS)	1.1.1. Explain the responsibility for the provision of a FIS	2	ICAO Doc 4444 Part 2 Para 4
	1.1.2. Relay appropriate information concerning the location of other conflicting traffic	3	Traffic information; Essential traffic information
	1.1.3. Provide FIS	4	ICAO Doc 4444
	1.1.4. Use radar for the provision of FIS	3	ICAO Doc 4444 part 8; Information to identified aircraft on: traffic, weather, navigation
1.2. Alerting Service	1.2.1. Explain the responsibility for the provision of an alerting service	2	ICAO ANNEX 11
	1.2.2. Provide appropriate action in abnormal situations	4	ICAO Doc 4444 - special codes; Seek assistance (TRM); Checklist; National legislation/ requirements; Overdue action; Emergency action; Uncertainty; Alert; Distress
	1.2.3. Respond to distress and urgency messages and signals	3	Priority allocation; Special purpose codes
	1.2.4. Apply national requirements in abnormal situations	3	
	1.2.5. Co-ordinate with RCC	4	
	1.2.6. Provide appropriate action in abnormal situations using radar derived information	4	

TOPIC / SUBTOPIC	**OBJECTIVES** Students shall	**L**	**CONTENT**
1.3. Air Traffic Flow Management (ATFM)	1.3.1. Apply principles of ATFM	3	Working principles of ATFM; FUA; Free Flight
	1.3.2. Organise traffic flows and patterns to take account of airspace boundaries	4	Civil and Military; Controlled; Uncontrolled; Advisory; Restricted; Danger; Prohibited; Special rules; Sector Boundaries; National Boundaries; FIR Boundaries; Delegated airspace; Transfer of control; Transfer of Communications; En-route; Off-route
	1.3.3. Organise traffic flows and patterns to take account of radar coverage	4	En-route ACC
	1.3.4. Organise traffic flows and patterns to take account of areas of responsibility	4	Capacity of adjacent sectors; Capacity of own sector; Evaluation of personal traffic load;
	1.3.5. Balance demand against capacity	5	Evaluation of other Sources of predicted Traffic load
	1.3.6. Inform supervisor of situation	3	e.g. Abnormal situations; Decrease in sector capacity; Limitations on Systems and Equipment; Changes in workload/ capacity; Relevant information (e.g. reported ground-based Incidents, forest fire, smoke, oil pollution); Unusual Meteorological Conditions
	1.3.7. Apply flow management procedures	3	
1.4. Airspace Management (ASM)	1.4.1. Appreciate the working principle of ASM	3	FUA
	1.4.2. Organise traffic to take account of ASM	4	Conditional routes

TOPIC / SUBTOPIC	**OBJECTIVES** Students shall	**L**	**CONTENT**
2. COMMUNICATION Students shall appreciate the necessity for effective communication and use approved phraseology.			
2.1. Effective Communication	2.1.1. Analyse examples of pilot and operator communication for effectiveness	4	
	2.1.2. Explain the need for approved phraseology	2	ICAO Doc 4444 Part 10; ICAO Doc 9432; Standard words and phrases as contained in ICAO ANNEX 10 Chapter 5
	2.1.3. Use ICAO approved phraseology	3	ICAO Doc 4444 Part 10; ICAO Doc 9432; Standard words and phrases as contained in ICAO ANNEX 10 Chapter 5
	2.1.4. Use national approved phraseology when applicable	3	
	2.1.5. Perform communication effectively	3	Transmission techniques
2.2. Phraseology for Unusual Events	2.2.1. Analyse examples of pilot and operator communication for effectiveness	4	
	2.2.2. Interpret the rules to provide an effective service where approved phraseology is not available	5	Receiver (RX) only; Transmitter (TX) only; Speechless aircraft; Incomplete messages
2.3. Mode-S Data Transfer	2.3.1. Appreciate the use of Mode S	3	Data which can be exchanged; Limitations; Advantages; Disadvantages
3. ATC CLEARANCES AND INSTRUCTIONS Students shall design and relay appropriate clearances and instructions.			
3.1 Type and Content of ATC Clearances	3.1.1 Define ATC clearance	1	ICAO Annex 2, Chapter 1
	3.1.2 Describe the contents of an ATC clearance	2	ICAO Doc 4444,
3.2. ATC Clearances	3.2.1. Relay appropriate ATC clearances	4	e.g. Climb; Joining; En-route
3.3 Type and Content of ATC Instructions	3.3.1 Define ATC instructions	1	ICAO Doc 4444, Part 1
	3.3.2 Describe the contents of ATC instructions	2	ICAO Doc 4444,
3.4. ATC Instructions	3.4.1. Relay appropriate ATC instructions	4	e.g. SSR Code; Other

TOPIC / SUBTOPIC	**OBJECTIVES** Students shall	**L**	**CONTENT**
4. CO-ORDINATION Students shall understand the need for, and conduct co-ordination.			
4.1 Principles, Types and Content	4.1.1 Explain the principles of co-ordination	2	e.g. notification, negotiation, agreement, transfer of flight data and local agreements ICAO Doc 4444, ICAO Annex 11
4.2. Necessity	4.2.1. Identify the need for co-ordination	3	
4.3. Tools and Methods	4.3.1 Describe the means of co-ordination	2	e.g. data link, telephone, intercom, voice
	4.3.2. Use the available tools for co-ordination methods	3	Electronic transfer of flight data; Telephone; Interphone; Intercom; Direct speech; Radio-telephony; Local agreements
4.4. Co-ordination Procedures	4.4.1. Initiate appropriate co-ordination	3	Delegation/transfer of responsibility for air/ ground communications and separation; Release Point; Transfer of control
	4.4.2. Analyse effect of co-ordination requested by an adjacent operational position	4	Delegation/transfer of responsibility for air/ ground communications and separation; Release Point; Transfer of control
	4.4.3. Select after negotiation an appropriate course of action	5	Including the cases: When additional traffic cannot be accepted by adjacent sector; When additional traffic cannot be accepted by own sector
	4.4.4. Ensure the agreed course of action is carried out	4	
5. ALTIMETRY AND LEVEL ALLOCATION Students shall calculate and allocate appropriate levels to aircraft.			
5.1. Altimetry	5.1.1. Calculate appropriate levels	3	e.g. TRL; TA; Transition layer; Height; Flight level; Altitude, Vertical distance to airspace boundaries
	5.1.2. Inform aircraft of appropriate levels (height, altitude, flight level) according to altimetry data	4	ICAO Doc 8168
5.2. Terrain Clearance	5.2.1. Integrate safe vertical distance from terrain into information actions	4	e.g. Lowest available flight level; Minimum safe altitude; Minimum Sector Altitude (MSA)
5.3. Mode C	5.3.1. Ensure correct mode C response	4	

TOPIC / SUBTOPIC	**OBJECTIVES** Students shall	**L**	**CONTENT**
6. SEPARATION STANDARDS Students shall select and maintain appropriate separation between aircraft.			
6.1. Wake Turbulence Separation	6.1.1. Explain the wake turbulence categories and separations	2	ICAO Doc 4444
	6.1.2. Provide information relevant to wake turbulence radar separation	4	
7. DATA DISPLAY Students shall analyse data in order to manage air traffic.			
7.1. Data Extraction	7.1.1. Extract pertinent data from a flight plan to produce a flight progress display	3	Flight progress Strips, electronic data display
	7.1.2. Extract pertinent data from other sources to produce a flight progress display	3	Pilot reports, co-ordination, data exchange
7.2. Data Management	7.2.1. Update the data display to accurately reflect the traffic situation	3	Information displayed; Strip marking procedures; Electronic information data displays; Actions based on traffic display information; Calculation of EETs
	7.2.2. Analyse pertinent data on data displays	4	
	7.2.3. Organise pertinent data on data displays	4	
8. OPERATIONAL ENVIRONMENT Students shall recognise and maintain the integrity of the simulated operational environment.			
8.1. Integrity of the Operational Environment	8.1.1. Obtain information concerning the operational environment	3	e.g. Briefing; Takeover; Notices; Local orders; Verify information
	8.1.2. Check and maintain the integrity of the operational environment	3	e.g. Integrity of displays; Verify the information provided by displays
	8.1.3. Inform the relieving controller of the operational environment	3	e.g. Briefing; Takeover; Notices; Local orders; Verify information
8.2. Verification of the Currency of Operational Procedures	8.2.1. Check all relevant Documentation before managing traffic	3	e.g. Briefing; LOAs; NOTAM; AICs
	8.2.2. Apply the procedural changes while managing traffic	3	

TOPIC / SUBTOPIC	**OBJECTIVES** Students shall	**L**	**CONTENT**
9. PROVISION OF FLIGHT INFORMATION SURVEILLANCE SERVICE Students shall provide an appropriate flight information service, applicable to the specific rating.			
9.1. General	9.1.1. Describe the division of responsibility between ATS units	2	ICAO Doc 4444; National Requirements
	9.1.2. Describe the responsibility in regard to military traffic	2	ICAO Doc 4444; National requirements
	9.1.3. Obtain operational information	3	ICAO Doc 4444; Local operational manuals
	9.1.4. Interpret operational information	5	
	9.1.5. Organise forwarding of operational information	5	
	9.1.6. Integrate operational information into decisions	4	
9.2. Flight information service with Radar	9.2.1. Explain the responsibility for the provision of a FFS radar Service	2	ICAO Doc 4444; Local operational Manuals
	9.2.2. Explain the functions that can be performed with the use of radar derived information in an FFS/RAD service	2	ICAO Doc 4444

TOPIC / SUBTOPIC	**OBJECTIVES** Students shall	**L**	**CONTENT**
10. HOLDING Students shall manage holding traffic.			
10.1. Holding	10.1.1. Appreciate the need for holding patterns	3	ICAO Doc 4444; Separation from holding patterns
	10.1.2. Issue holding information	3	
	10.1.3 Assist in calculating expected onward clearance times	3	
	10.1.4. Consider the effect of: wind, aircraft speed, rate of turn, height, aircraft type, aircraft performance	2	
	10.1.5. Update information on holding levels	4	
	10.1.6. Provide information between aircraft in a holding pattern	4	
	10.1.7. Provide information between aircraft in a holding pattern and transiting aircraft	4	
10.2. Holding in a Radar Environment	10.2.1. Provide advise to aircraft entering a holding pattern	4	
	10.2.2. Provide advise to transiting aircraft about separation from a holding area	4	
	10.2.3. Provide advise to aircraft leaving a holding pattern	4	
	10.2.4. Ensure re-identification of aircraft leaving a holding pattern	4	

TOPIC / SUBTOPIC	**OBJECTIVES** Students shall	**L**	**CONTENT**
11. RADAR IDENTIFICATION Students shall: i. establish and maintain radar identification; ii. respond to a loss of radar identification.			
11.1. Establishment of Radar Identification	11.1.1. Apply the methods of establishing radar identification using primary radar	3	ICAO Doc 4444
	11.1.2. Appreciate the precautions when establishing radar identification using primary radar	3	
	11.1.3. Apply methods of establishing radar identification using secondary radar	3	
	11.1.4. Appreciate the precautions when establishing radar identification using secondary radar	3	
	11.1.5. Apply procedures in the case of misidentification	3	
11.2. Maintenance of Radar Identification	11.2.1. Appreciate the necessity to maintain radar identification at all times	3	
11.3. Loss of Radar Identity	11.3.1. Appreciate when an aircraft identification is lost or in doubt	3	e.g. Out of radar coverage; Loss of radar service; Weather clutter; Other clutter; Garbling
	11.3.2. Apply methods to re-establish radar identification	3	
	11.3.3. Respond to loss/doubt concerning radar identification	3	Non-radar procedures
11.4. Position Information	11.4.1. Appreciate the circumstances when radar position information should be passed to the aircraft	3	
11.5. Transfer of Identity	11.5.1. Appreciate the precautions when transferring radar identification	3	
	11.5.2. Apply the methods of transfer of radar identification	3	

TOPIC / SUBTOPIC	**OBJECTIVES** Students shall	**L**	**CONTENT**
11.6 Termination of radar service	11.6.1. Appreciate the procedures applied when terminating radar service 11.6.2. Apply the procedures for termination of radar service	3 3	ICAO doc 4444 chapter 8
12 COLLISION AVOIDANCE			
12.1 Airborne	12.1.1 Explain the effect of airborne collision avoidance systems on ATC operations	2	e.g. ACAS, TCAS
12.2 Radar	12.2.1. Explain when to provide avoidance actions 12.2.2. Provide information and actions in potential collision situations	2 4	
13 WORKING POSITIONS			
13.1 General	13.1.1 Identify equipment in a working position	1	e.g. FPB, radio, telephone and other communication equipment, relevant maps and charts, strip printer, teleprinter, clock, information monitors, radar/displays
13.2 Flight information Centre	13.2.1 Identify equipment to be found specifically in a flight information centre	1	e.g. sequencing system

SUBJECT 4: METEOROLOGY

The general objective is:
Students shall acquire, decode and make proper use of Meteorological information relevant to the provision of ATS to ACC en-route traffic.

TOPIC / SUBTOPIC	**OBJECTIVES** Students shall	**L**	**CONTENT**
1. ATMOSPHERIC PROCESSES Students shall calculate and integrate the minimum flight levels into their decision-making process.			
1.1. Air Pressure	1.1.1. Calculate the minimum applicable altitude/flight level being given appropriate meteorological data	3	Transition altitude; Transition level; Minimum flight level; Transition layer
2. METEOROLOGICAL PHENOMENA Students shall analyse and take account of meteorological phenomena in his control actions.			
2.1. Planning and Co-ordination	2.1.1. Analyse data about meteorological phenomena	4	Wind; Clouds; Precipitation; Pressure settings; Thunderstorms; Icing; Jetstreams; Clear Air Turbulence (CAT); Turbulence; Microburst; Marked mountain waves; Line squalls; Solar radiation
	2.1.2. Integrate data into planning and co-ordination	4	
2.2. Weather Avoidance	2.2.1. Use radar vectoring techniques to avoid adverse weather when necessary/possible	3	
	2.2.2. Use radar vectoring techniques to avoid areas of radar clutter	3	
2.3. Clearances and Instructions	2.3.1. Analyse data about meteorological phenomena	4	Wind; Clouds; Precipitation; Pressure settings; Thunderstorms; Icing; Jetstreams; Clear Air Turbulence (CAT); Turbulence; Microburst; Marked mountain waves; Line squalls; Solar radiation
	2.3.2. Integrate data into clearances and instructions	4	

TOPIC / SUBTOPIC	**OBJECTIVES** Students shall	**L**	**CONTENT**
2.4. Information	2.4.1. Obtain meteorological information	3	Wind; Clouds; Precipitation; Pressure settings; Thunderstorms; Icing; Jetstreams; CAT; Turbulence; Microburst; Marked mountain waves; Line squalls; Solar Radiation
	2.4.2. Relay meteorological information	3	To: Aircraft; Meteorological Office; FIS
	2.4.3. Decode meteorological information	3	
	2.4.4. Analyse data about meteorological phenomena	4	
	2.4.5. Integrate data into transmitted information	4	

SUBJECT 5: NAVIGATION

The general objective is:
Students shall analyse all Navigational aspects in order to organise the traffic.

TOPIC / SUBTOPIC	**OBJECTIVES** Students shall	**L**	**CONTENT**
1. APPLIED NAVIGATION Students shall appreciate the information on maps and charts and integrate this into control decisions.			
1.1. Maps and Charts	1.1.1. Use maps and charts for planning and co-ordination purposes	3	
1.2. Pilot Interpreted Ground-based System	1.2.1. Estimate the behaviour of aircraft according to the operational status of navigational ground-based systems	3	Limitations of navigation aids; Status of NAVAIDS
1.3. On-board Systems	1.3.1. Estimate the behaviour of aircraft according to the operational status of navigational on-board systems	3	Limitations of on-board navigation systems
1.4. Satellite-based Systems	1.4.1. Estimate the behaviour of aircraft according to the operational status of navigational satellite-based systems	3	GPS; GLONASS; GNSS
1.5. Future Developments	1.5.1. Be informed about existing projects and developments which will impact on the work in the future	0	e.g. Briefing, seminars, courses, workshops, technical journals, aviation journals
1.6. Navigational Assistance	1.6.1. Evaluate the necessary information to be provided to pilots in need of navigational assistance	5	Nearest most suitable aerodrome; Track; Heading; Distance; Aerodrome information; Any other navigational assistance relevant at the time
	1.6.2. Assist aircraft observed to be deviating from its known intended route	3	

BLANK

SUBJECT 6: AIRCRAFT

The general objective is:
Students shall assess Aircraft performance to integrate it into traffic organisation.

TOPIC / SUBTOPIC	**OBJECTIVES** Students shall	**L**	**CONTENT**
1. AIRCRAFT INSTRUMENTS Students shall understand the relevance of the cockpit information presented to the pilot.			
1.1. Cockpit Instruments	1.1.1. Integrate the information provided by the pilot into the traffic situation	4	Flight Instruments; Engine Instruments; Navigational Instruments; NDB (ADF); VOR (TACAN); DME; ILS; MLS; Additional Instruments; TCAS; SSR transponder; Head up display; GPWS; Wind shear indicator; Weather radar; FMS; EFIS
2. AIRCRAFT TYPES AND CATEGORIES Students shall characterise wake turbulence and ICAO approach categories.			
2.1. Wake Turbulence Categories	2.1.1. Characterise each wake turbulence category and explain how to prevent their effect on other aircraft	2	
2.2. Planning	2.2.1. Consider ICAO approach aircraft categories for planning purposes	2	Categories A, B, C, D, E
3. FACTORS AFFECTING AIRCRAFT PERFORMANCE Students shall integrate aircraft performance factors in the provision of flight information service.			
3.1. Climb	3.1.1. Integrate the effect of factors affecting aircraft during climb into the analysis of traffic situations	4	
3.2. Cruise	3.2.1. Integrate the effect of factors affecting aircraft during cruise into the analysis of traffic situations	4	
3.3. Descent	3.3.1. Integrate the influence of factors affecting aircraft during descent in the analysis of traffic situations	4	
3.4. Economic Factors	3.4.1. Integrate consideration of economic factors into control actions 3.4.2. Use continuous climb techniques where applicable 3.4.3. Use direct routing where applicable	4 3 3	Routing; Flight level; Speed; Rates of climb or descent

TOPIC / SUBTOPIC	**OBJECTIVES** Students shall	**L**	**CONTENT**
3.5. Miscellaneous Factors	3.5.1. Integrate operational requirements into planning	4	e.g. Military flying; Calibration flights; Aerial photography
	3.5.2. Explain the effect of antenna shadowing on RTF communications	2	
	3.5.3. Explain the effect of antenna shadowing on SSR operation	2	
	3.5.4. Integrate factors effecting aircraft into planning	4	Message relays regarding performance
	3.5.5. Explain the operation of aircraft additional equipment	2	Radios (number of); Emergency radios; SELCAL
	3.5.6. Explain the operation of aircraft additional equipment	2	Oxygen masks; Pressurisation; Noise, interference
	3.5.7. Explain the operation of aircraft additional equipment	2	Transponders: Mode A, Mode C, Mode S
4. AIRCRAFT DATA Students shall: i. use the standard average performance data for the provision of flight information service; ii. recognise potential or actual emergency situations; iii. apply standard solutions in the case of simple situations.			
4.1. Performance Data	4.1.1. Integrate the known aircraft performance data into information/ advise action decisions	4	Rate of climb/descent; Cruising speed, Ceiling

SUBJECT 7: HUMAN FACTORS

The general objectives is:
Students shall:
i. recognise the necessity to constantly extend their knowledge;
ii. analyse factors which affect personal and team performance.

TOPIC / SUBTOPIC	**OBJECTIVES** Students shall	**L**	**CONTENT**
1. PSYCHOLOGICAL FACTORS Students shall relate psychological factors to the decision-making process.			
1.1. Cognitive	1.1.1. Describe the factors which influence decision-making	2	e.g. Stress; Learning; Knowledge; Fatigue; Alcohol/drugs; Distraction; Interpersonal relations; TRM
	1.1.2. Relate human factors to decision-making	4	
2. MEDICAL AND PHYSIOLOGICAL FACTORS Students shall respond to fatigue and lack of personal fitness in the performance of their duties.			
2.1. Fatigue	2.1.1. Describe the onset of fatigue	2	e.g. Lack of concentration; Listlessness; Irritability; Frustration
	2.1.2. Recognise the onset of fatigue in self	1	
	2.1.3. Recognise the onset of fatigue in others	1	
	2.1.4. Respond to indications of fatigue in an appropriate manner	3	
2.2. Fitness	2.2.1. Recognise signs of lack of personal fitness	1	
	2.2.2. Describe actions when aware of a lack of personal fitness	2	
3. SOCIAL AND ORGANISATIONAL FACTORS Students shall develop teamwork attitudes.			
3.1. Human Relations	3.1.1. Apply social and organisational factors to work with other team members	3	
3.2. Team Resource Management (TRM)	3.2.1. State the objectives of TRM	1	Suggested reference: ‘Guidelines for Developing and Implementing Team Resource Management’

TOPIC / SUBTOPIC	**OBJECTIVES** Students shall	**L**	**CONTENT**
3.3. Group Dynamics	3.3.1. Identify the professional relationships between members of the group	3	
	3.3.2. Identify the reasons for conflicts	3	
	3.3.3. Describe actions to prevent repetitions	2	
	3.3.4. Take account of TRM Programmes	2	TRM
	3.3.5. Respond to the application of TRM techniques	3	e.g. Role of members; Allocation of responsibilities within the team; Benefits of having other team members to rely on; Safety aspects; Assistance in abnormal situations
4 COMMUNICATION Students shall: i. accurately complete written reports; ii. express themselves clearly so as to be understood by other team members and colleagues.			
4.1. Written Work	4.1.1. Record information by writing effectively	3	e.g. Strips; Reports; Log-books
	4.1.2. Pass information by writing effectively	3	
4.2. Verbal/Non-verbal Communication	4.2.1. Recognise human communication theory	1	e.g. Different languages; Air traffic language
	4.2.2. Characterise the factors which affect verbal communication	2	e.g. Speed of speech; Frequency; Volume; Background noise
	4.2.3. Characterise non-verbal communication	2	e.g. Body language; Facial expressions
	4.2.4. Use language effectively in the practice of ATC	3	
5. STRESS Students shall integrate stress management procedures in the performance of their duties.			
5.1. Stress	5.1.1. Recognise the effects of stress	1	Stress and its symptoms in self and in others
5.2. Helplessness	5.2.1. Respond to feelings of helplessness	3	Normal/abnormal situations

TOPIC / SUBTOPIC	**OBJECTIVES** Students shall	**L**	**CONTENT**
5.3. Stress Management	5.3.1. Act to relieve or minimise stress in self and/or others	3	The effect of personality in coping with stress; The benefits of active Stress management
	5.3.2. Obtain assistance in stressful situations	3	TRM; CISM; The Benefits of offering and accepting help in stress situations
	5.3.3. Recognise the effect of shocking and stressful events	1	Self and others; Abnormal situations; CISM; TRM
	5.3.4. Consider the benefits of Critical Incident Stress Management (CISM)	2	CISM
	5.3.5. Explain the procedures used following an incident/accident	2	CISM; National/Local Procedures and/or Regulations; Counselling; Human Element
6. HUMAN ERROR Students shall be able to discuss the concept of human error.			
6.1. Human Error	6.1.1. Explain the relationship between error and safety	2	Number and Combination of errors; Pro-active versus reactive approach to discovery of error
	6.1.2. State the different types of error	1	Slips; Lapses; Mistakes; Violations
	6.1.3. Differentiate between errors and violations	2	
	6.1.4. Describe errorprone conditions	2	
7. WORKING METHODS Students shall discuss the effect of human factors consideration on efficiency.			
7.1. Efficiency	7.1.1. Consider, from a human factors point of view, the factors affecting efficiency in the provision of ATC	2	Own workload; Adjacent sector workload; OJT; Customer requirements; Economy; Ecology; Safety
8. WORKING KNOWLEDGE Students shall explain the importance of maintaining and updating professional knowledge.			
8.1. Controller Knowledge	8.1.1. Maintain and update professional knowledge to retain competence in the operational environment	3	e.g. Briefing; LOAs; NOTAM; AICs; Reports of accident/incident; VOLMET; ATIS; SIGMET

BLANK

SUBJECT 8: EQUIPMENT AND SYSTEMS

The general objective is:
Students shall:
i. demonstrate knowledge and understanding of the basic working principles of Equipment that is in generally use in ATS;
ii. select and operate the appropriate Equipment in order to provide a safe and efficient ATS service in a simulated environment.

TOPIC / SUBTOPIC	**OBJECTIVES** Students shall	**L**	**CONTENT**
1. GENERAL Students shall be familiar with typical equipment to be found in a control environment.			
1.1. ATS Equipment	1.1.1. Maintain the technical integrity of the operational position	3	Notification procedures; Responsibilities
	1.1.2. Operate the various items of equipment in the simulator	3	Electronic displays; Flight progress board (strip display); Meaning of colours
	1.1.3. Operate all available equipment in abnormal situations	3	
1.2. Operator Knowledge	1.2.1. Explain the importance of maintaining professional knowledge	2	
	1.2.2. List the available means to maintain professional knowledge	1	e.g. Briefing; Seminars; Courses; Workshops; Technical journals; Aviation journals; Familiarisation flights
2. RADIO Students shall correctly operate the radio and Direction Finding equipment.			
2.1. Radio Theory	2.1.1. Consider radio range	2	Transfer to another frequency; Apparent radio failure; Failure to get radio contact
2.2. Radio Communications	2.2.1. Operate two-way communication	3	Equipment; Procedures; Frequency selection; All available equipment in abnormal situations
	2.2.2. Check for indications of correct operation of radio equipment	3	Indicator lights; Serviceability displays; Selector/frequency Displays
	2.2.3 Check for faulty operation of radio equipment	3	Indicator lights Serviceability displays; Selector/frequency Displays
	2.2.4 Initiate corrective action when faulty operation is detected	3	In accordance with local instructions and procedures

TOPIC / SUBTOPIC	**OBJECTIVES** Students shall	**L**	**CONTENT**
2.3. Direction Finding	2.3.1. Measure and decode Direction Finding information	3	e.g. ADF/UDF/VDF; QDM; QDR; QTE
	2.3.2. Use Direction Finding information to assist in managing a safe orderly and expeditious flow of traffic	3	ADF/UDF/VDF
3. OTHER VOICE COMMUNICATIONS Students shall operate the communication equipment.			
3.1. ATS Communications	3.1.1. Use telephone, interphone and intercom	3	In accordance with local instructions and procedures
4. RADAR Students shall use the radar equipment.			
4.1. Use of Radar	4.1.1. Operate radar equipment	4	Switch on and adjust settings in accordance with local instructions
	4.1.2. Operate appropriate anticlutter devices	3	In accordance with local instructions; Weather clutter; Permanent echoes; Unwanted targets Including: Use;
	4.1.3. Analyse the information provided by the radar equipment	4	Advantages; Limitations
4.2. Secondary Radar	4.2.1. Explain code management	2	Normal codes; Special codes; International; National; Local
	4.2.2. Allocate codes	3	
5. FUTURE EQUIPMENT Students shall be aware of known future developments.			
5.1. Known New Developments	5.1.1. Be aware of future developments	0	e.g. Voice recognition; Mode S
6. AUTOMATION IN ATS Students shall decode/encode automated data.			
6.1. Aeronautical Fixed Telecom-munications Network (AFTN)	6.1.1. Identify and decode the information disseminated through AFTN	3	Aircraft movement messages; NOTAM; SNOWTAM; BIRDTAM
6.2. On-Line Data Interchange (OLDI)	6.2.1. Operate electronic data transfer equipment	3	
7. OPERATIONAL POSITIONS Students shall identify, interpret and operate the equipment.			
7.1. General	7.1.2. Use equipment in a FFS operational position	3	
7.2. Information Systems	7.2.1. Check availability of information material	3	
7.3. Flight Data Systems	7.3.1. Integrate the flight data displays at operational positions	4	Working principles; Duties; Equipment in use

TOPIC / SUBTOPIC	**OBJECTIVES** Students shall	**L**	**CONTENT**
8. SYSTEMS LIMITATIONS Students shall understand the significance of system limitations.			
8.1. System and Equipment Limitations	8.1.1. Take account of the limitations of systems and equipment	2	

BLANK

SUBJECT 9: PROFESSIONAL ENVIRONMENT

The general objective is:
Students shall identify the need for close co-operation with other agencies.

TOPIC / SUBTOPIC	**OBJECTIVES** Students shall	**L**	**CONTENT**
1. STUDY VISITS When available, students shall participate in programmes to enhance their knowledge and understanding of ATS.			
1.1. Flight Familiarisation	1.1.1. Participate in familiarisation flight programmes	3	
	1.1.2. Participate in flight simulator programmes	3	
1.2. Other Units	1.2.1. Characterise civil and military facilities	2	Preferably by study visits to TWR; APP; ACC; AIS; RCC; Air Defence Units
1.3. Customer Relations	1.3.1. Appreciate the role of ATS as a service provider	3	
	1.3.2. Appreciate the requirements of the users	3	e.g. Civil and military operators; Business users; Recreational operators; Airport authorities

BLANK

SUBJECT 10: UNUSUAL/EMERGENCY SITUATIONS

The general objective is:
Students shall manage air traffic in Unusual/Emergency situations.

TOPIC / SUBTOPIC	**OBJECTIVES** Students shall	**L**	**CONTENT**
1.1. Aircraft Problems	1.1.1. List aircraft failures	1	e.g. Engine failure; Hydraulic failure; Fire on board; Lack of fuel; Bird strike; Transponder failure; Decompression; ACFT lost/unsure of Position
	1.1.2. Apply the recommended ATS procedures for given unusual Situations	3	
1.2. Unknown Traffic	1.2.1. Apply the procedures in the case of unknown traffic	3	Inside controlled airspace; Outside controlled airspace; IFR/VFR
1.3. Radar Vectoring Outside Controlled Airspace	1.3.1. Explain the circumstances which may require aircraft to be vectored out of controlled airspace	2	Weather avoidance; Emergency; Traffic Avoidance
	1.3.2. Apply procedures regarding vectoring out of controlled airspace	3	e.g. Co-ordination; Information to Aircraft
1.4. Transponder Failure	1.4.1. Apply procedures in the event of a SSR transponder failure	3	e.g. Total, Partial; National Regulations; ICAO Doc 4444; ICAO Doc 7030
1.5. Radio Failure	1.5.1. Apply procedures when a controller experiences complete or partial failure of ground radio communication equipment	3	
	1.5.2. Explain the procedures followed by a pilot when he experiences complete or partial radio failure	2	e.g. Civil; Military; Special national procedures
	1.5.3. Apply ATS procedures associated with a pilot experiencing complete or partial radio failure	3	e.g. Civil; Military; Special national procedures

TOPIC / SUBTOPIC	**OBJECTIVES** Students shall	**L**	**CONTENT**
1.6. Diversions	1.6.1. Provide flight information to diverting aircraft	4	Nearest most suitable aerodrome; Aerodrome Information
	1.6.2. Provide flight information to other aircraft	4	e.g. Concerning an emergency descent
	1.6.3. Perform appropriate co-ordination	3	e.g. Other sectors and units
	1.6.4. Provide navigational assistance to diverting aircraft	4	Track/heading; Distance; Other Navigational assistance
	1.6.5. Provide radar advise to diverting aircraft	4	Track/heading; Distance
1.7. Hijack	1.7.1. Apply ATS procedures associated with hijack	3	National; International

SUBJECT 11: DEGRADED SYSTEMS CAPABILITY

The general objective is:
Students shall integrate System Degradation Procedures in the management of air traffic.

TOPIC / SUBTOPIC	**OBJECTIVES** Students shall	**L**	**CONTENT**
1. COMMUNICATION EQUIPMENT Students shall ensure the transfer of data by alternative methods.			
1.1. Ground/Air Radio Equipment	1.1.1. Recognise that ground radio equipment has degraded	1	e.g. VHF; UHF; HF
	1.1.2. Provide information to aircraft using standby/backup equipment	4	
1.2. Ground/Ground Equipment	1.2.1. Recognise that equipment has degraded	1	e.g. Telephone; Interphone; Intercom
	1.2.2. Provide information to adjacent sectors by using standby/backup equipment	4	
1.3. Data Link Equipment	1.3.1. Recognise data link equipment has degraded	1	e.g. Mode S; Automatic data transfer; Automatic co-ordination
	1.3.2. Use alternative methods of transferring data between ground and aircraft	3	e.g. Ground/air radio
	1.3.3. Use alternative methods of transferring data between units/work stations	3	e.g. Telephone; Direct pointing; Intercom
2. SURVEILLANCE EQUIPMENT Students shall respond to degradation of surveillance equipment.			
2.1. Partial or Total Degradation	2.1.1. Recognise that surveillance equipment has degraded	1	Partial power failure; Loss of certain facilities; Total failure
	2.1.2. Integrate remedial procedures and/or techniques	3	e.g. Inform adjacent sectors; Inform aircraft; Apply vertical separation (emergency, increased); Increased radar separation; Reduce the number of aircraft entering area of responsibility; Transfer aircraft to another unit
3. PROCESSING SYSTEMS Students shall respond to degradation in the processing systems associated with the surveillance equipment.			
3.1. ATC Processing System Degradation	3.1.1. Recognise a system degradation	1	e.g. FPS; RDPS; Software processing of surveillance display
	3.1.2. Integrate appropriate procedure following a processing system degradation	3	e.g. National procedures; Local unit procedure

TOPIC / SUBTOPIC	**OBJECTIVES** Students shall	**L**	**CONTENT**
4. NAVIGATION EQUIPMENT Students shall respond to the degradation of non-surveillance navigation equipment.			
4.1. Navigational Aid Degradation	4.1.1. Recognise when a navigational equipment failure will effect operational ability	1	e.g. VOR; Approach aids
	4.1.2. Integrate appropriate procedures in the event of a navigational equipment failure	3	e.g. Vertical separation (standard, emergency); Other non-radar separation (geographical, visual); Inform aircraft; Seek assistance from adjacent units

SUBJECT 12: AERODROMES

Not applicable in this Module ” FIR Flight Information Service Surveillance Rating with Radar Endorsement”

END OF DOCUMENT