



# **TRAINING MANUAL**

## **PART 4**

**GLOBAL AIR SERVICES**



**GR-FTO-002**



## Table of Contents

<b>LIST OF EFFECTIVE PAGES .....</b>	<b>3</b>
<b>4 THEORETICAL KNOWLEDGE INSTRUCTION .....</b>	<b>7</b>
4.1 ATPL(A) INTEGRATED COURSE .....	7
4.1.1 <i>Course Structure</i> .....	7
4.2 CPL/IR(A) INTEGRATED COURSE.....	8
4.2.1 <i>Course Structure</i> .....	8
4.3 CPL(A) INTEGRATED COURSE .....	9
4.3.1 <i>Course Structure</i> .....	9
4.4 CPL(A) MODULAR COURSE.....	10
4.4.1 <i>Course Structure</i> .....	10
Distance Learning Course .....	10
4.5 ATPL(A) MODULAR COURSE.....	12
4.5.1 <i>Course Structure</i> .....	12
Distance Learning Course .....	12
4.6 PPL(A) COURSE.....	14
4.6.1 <i>Course Structure</i> .....	14
Distance learning.....	14
4.7 IR(A) MODULAR TRAINING COURSE.....	15
4.7.1 <i>Course Structure</i> .....	15
Distance Learning Course .....	15
4.8 SINGLE PILOT MULTI ENGINE CLASS RATING (SP/ME(A)).....	16
4.8.1 <i>Course Structure</i> .....	16
4.9 FLIGHT INSTRUCTOR RATING (AEROPLANES) FI(A)) COURSE.....	17
4.9.1 <i>Course Structure</i> .....	17
4.10 CLASS RATING INSTRUCTOR RATING – AEROPLANE (CRI(A)).....	18
4.10.1 <i>Course Structure</i> .....	18
4.11 INSTRUMENT RATING INSTRUCTOR RATING (AEROPLANE) (IRI(A)).....	20
4.11.1 <i>Course Structure</i> .....	20
4.12 FLIGHT INSTRUCTOR (FI)/INSTRUMENT RATING INSTRUCTOR (IRI)/CLASS RATING INSTRUCTOR (CRI) REFRESHER SEMINAR.....	22
4.12.1 <i>Course Structure</i> .....	22
4.13 INSTRUMENT RATING (IR(A)) / CLASS RATING (MEP(A)) REFRESHER SEMINAR.....	24
4.13.1 <i>Course Structure</i> .....	24
4.14 NIGHT QUALIFICATION (JAR-FCL 1.125(c)).....	26
4.14.1 <i>Course Structure</i> .....	26
APPENDIX 1.....	27
APPENDIX 2.....	209
APPENDIX 3.....	261
APPENDIX 4.....	265
APPENDIX 5.....	293
APPENDIX 6.....	319
APPENDIX 7.....	345
APPENDIX 8.....	357
APPENDIX 9.....	361



**TRAINING MANUAL  
PART 4  
Theoretical Knowledge  
Instruction**

Page: 2  
Revision: 1  
Date: 6 Feb 2009

**LIST OF EFFECTIVE PAGES**

Page No	Revision	Date Of Revision	Page No	Revision	Date Of Revision	Page No	Revision	Date Of Revision	
1	TOC	1	06 Feb 2009	48	1	06 Feb 2009	95	1	06 Feb 2009
2		1	06 Feb 2009	49	1	06 Feb 2009	96	1	06 Feb 2009
3	LEP	1	06 Feb 2009	50	1	06 Feb 2009	97	1	06 Feb 2009
4		1	06 Feb 2009	51	1	06 Feb 2009	98	1	06 Feb 2009
5		1	06 Feb 2009	52	1	06 Feb 2009	99	1	06 Feb 2009
6		1	06 Feb 2009	53	1	06 Feb 2009	100	1	06 Feb 2009
7		1	06 Feb 2009	54	1	06 Feb 2009	101	1	06 Feb 2009
8		1	06 Feb 2009	55	1	06 Feb 2009	102	1	06 Feb 2009
9		1	06 Feb 2009	56	1	06 Feb 2009	103	1	06 Feb 2009
10		1	06 Feb 2009	57	1	06 Feb 2009	104	1	06 Feb 2009
11		1	06 Feb 2009	58	1	06 Feb 2009	105	1	06 Feb 2009
12		1	06 Feb 2009	59	1	06 Feb 2009	106	1	06 Feb 2009
13		1	06 Feb 2009	60	1	06 Feb 2009	107	1	06 Feb 2009
14		1	06 Feb 2009	61	1	06 Feb 2009	108	1	06 Feb 2009
15		1	06 Feb 2009	62	1	06 Feb 2009	109	1	06 Feb 2009
16		1	06 Feb 2009	63	1	06 Feb 2009	110	1	06 Feb 2009
17		1	06 Feb 2009	64	1	06 Feb 2009	111	1	06 Feb 2009
18		1	06 Feb 2009	65	1	06 Feb 2009	112	1	06 Feb 2009
19		1	06 Feb 2009	66	1	06 Feb 2009	113	1	06 Feb 2009
20		1	06 Feb 2009	67	1	06 Feb 2009	114	1	06 Feb 2009
21		1	06 Feb 2009	68	1	06 Feb 2009	115	1	06 Feb 2009
22		1	06 Feb 2009	69	1	06 Feb 2009	116	1	06 Feb 2009
23		1	06 Feb 2009	70	1	06 Feb 2009	117	1	06 Feb 2009
24		1	06 Feb 2009	71	1	06 Feb 2009	118	1	06 Feb 2009
25		1	06 Feb 2009	72	1	06 Feb 2009	119	1	06 Feb 2009
26		1	06 Feb 2009	73	1	06 Feb 2009	120	1	06 Feb 2009
27		1	06 Feb 2009	74	1	06 Feb 2009	121	1	06 Feb 2009
28		1	06 Feb 2009	75	1	06 Feb 2009	122	1	06 Feb 2009
29		1	06 Feb 2009	76	1	06 Feb 2009	123	1	06 Feb 2009
30		1	06 Feb 2009	77	1	06 Feb 2009	124	1	06 Feb 2009
31		1	06 Feb 2009	78	1	06 Feb 2009	125	1	06 Feb 2009
32		1	06 Feb 2009	79	1	06 Feb 2009	126	1	06 Feb 2009
33		1	06 Feb 2009	80	1	06 Feb 2009	127	1	06 Feb 2009
34		1	06 Feb 2009	81	1	06 Feb 2009	128	1	06 Feb 2009
35		1	06 Feb 2009	82	1	06 Feb 2009	129	1	06 Feb 2009
36		1	06 Feb 2009	83	1	06 Feb 2009	130	1	06 Feb 2009
37		1	06 Feb 2009	84	1	06 Feb 2009	131	1	06 Feb 2009
38		1	06 Feb 2009	85	1	06 Feb 2009	132	1	06 Feb 2009
39		1	06 Feb 2009	86	1	06 Feb 2009	133	1	06 Feb 2009
40		1	06 Feb 2009	87	1	06 Feb 2009	134	1	06 Feb 2009
41		1	06 Feb 2009	88	1	06 Feb 2009	135	1	06 Feb 2009
42		1	06 Feb 2009	89	1	06 Feb 2009	136	1	06 Feb 2009
43		1	06 Feb 2009	90	1	06 Feb 2009	137	1	06 Feb 2009
44		1	06 Feb 2009	91	1	06 Feb 2009	138	1	06 Feb 2009
45		1	06 Feb 2009	92	1	06 Feb 2009	139	1	06 Feb 2009
46		1	06 Feb 2009	93	1	06 Feb 2009	140	1	06 Feb 2009
47		1	06 Feb 2009	94	1	06 Feb 2009	141	1	06 Feb 2009



**TRAINING MANUAL  
PART 4  
Theoretical Knowledge  
Instruction**

Page: 4  
Revision: 1  
Date: 6 Feb 2009

Page No	Revision	Date Of Revision	Page No	Revision	Date Of Revision	Page No	Revision	Date Of Revision
142	1	06 Feb 2009	189	1	06 Feb 2009	236	1	06 Feb 2009
143	1	06 Feb 2009	190	1	06 Feb 2009	237	1	06 Feb 2009
144	1	06 Feb 2009	191	1	06 Feb 2009	238	1	06 Feb 2009
145	1	06 Feb 2009	192	1	06 Feb 2009	239	1	06 Feb 2009
146	1	06 Feb 2009	193	1	06 Feb 2009	240	1	06 Feb 2009
147	1	06 Feb 2009	194	1	06 Feb 2009	241	1	06 Feb 2009
148	1	06 Feb 2009	195	1	06 Feb 2009	242	1	06 Feb 2009
149	1	06 Feb 2009	196	1	06 Feb 2009	243	1	06 Feb 2009
150	1	06 Feb 2009	197	1	06 Feb 2009	244	1	06 Feb 2009
151	1	06 Feb 2009	198	1	06 Feb 2009	245	1	06 Feb 2009
152	1	06 Feb 2009	199	1	06 Feb 2009	246	1	06 Feb 2009
153	1	06 Feb 2009	200	1	06 Feb 2009	247	1	06 Feb 2009
154	1	06 Feb 2009	201	1	06 Feb 2009	248	1	06 Feb 2009
155	1	06 Feb 2009	202	1	06 Feb 2009	249	1	06 Feb 2009
156	1	06 Feb 2009	203	1	06 Feb 2009	250	1	06 Feb 2009
157	1	06 Feb 2009	204	1	06 Feb 2009	251	1	06 Feb 2009
158	1	06 Feb 2009	205	1	06 Feb 2009	252	1	06 Feb 2009
159	1	06 Feb 2009	206	1	06 Feb 2009	253	1	06 Feb 2009
160	1	06 Feb 2009	207	1	06 Feb 2009	254	1	06 Feb 2009
161	1	06 Feb 2009	208	1	06 Feb 2009	255	1	06 Feb 2009
162	1	06 Feb 2009	209	1	06 Feb 2009	256	1	06 Feb 2009
163	1	06 Feb 2009	210	1	06 Feb 2009	257	1	06 Feb 2009
164	1	06 Feb 2009	211	1	06 Feb 2009	258	1	06 Feb 2009
165	1	06 Feb 2009	212	1	06 Feb 2009	259	1	06 Feb 2009
166	1	06 Feb 2009	213	1	06 Feb 2009	260	1	06 Feb 2009
167	1	06 Feb 2009	214	1	06 Feb 2009	261	1	06 Feb 2009
168	1	06 Feb 2009	215	1	06 Feb 2009	262	1	06 Feb 2009
169	1	06 Feb 2009	216	1	06 Feb 2009	263	1	06 Feb 2009
170	1	06 Feb 2009	217	1	06 Feb 2009	264	1	06 Feb 2009
171	1	06 Feb 2009	218	1	06 Feb 2009	265	1	06 Feb 2009
172	1	06 Feb 2009	219	1	06 Feb 2009	266	1	06 Feb 2009
173	1	06 Feb 2009	220	1	06 Feb 2009	267	1	06 Feb 2009
174	1	06 Feb 2009	221	1	06 Feb 2009	268	1	06 Feb 2009
175	1	06 Feb 2009	222	1	06 Feb 2009	269	1	06 Feb 2009
176	1	06 Feb 2009	223	1	06 Feb 2009	270	1	06 Feb 2009
177	1	06 Feb 2009	224	1	06 Feb 2009	271	1	06 Feb 2009
178	1	06 Feb 2009	225	1	06 Feb 2009	272	1	06 Feb 2009
179	1	06 Feb 2009	226	1	06 Feb 2009	273	1	06 Feb 2009
180	1	06 Feb 2009	227	1	06 Feb 2009	274	1	06 Feb 2009
181	1	06 Feb 2009	228	1	06 Feb 2009	275	1	06 Feb 2009
182	1	06 Feb 2009	229	1	06 Feb 2009	276	1	06 Feb 2009
183	1	06 Feb 2009	230	1	06 Feb 2009	277	1	06 Feb 2009
184	1	06 Feb 2009	231	1	06 Feb 2009	278	1	06 Feb 2009
185	1	06 Feb 2009	232	1	06 Feb 2009	279	1	06 Feb 2009
186	1	06 Feb 2009	233	1	06 Feb 2009	280	1	06 Feb 2009
187	1	06 Feb 2009	234	1	06 Feb 2009	281	1	06 Feb 2009
188	1	06 Feb 2009	235	1	06 Feb 2009	282	1	06 Feb 2009

Page No	Revision	Date Of Revision	Page No	Revision	Date Of Revision	Page No	Revision	Date Of Revision
283	1	06 Feb 2009	318	1	06 Feb 2009	353	1	06 Feb 2009
284	1	06 Feb 2009	319	1	06 Feb 2009	354	1	06 Feb 2009
285	1	06 Feb 2009	320	1	06 Feb 2009	355	1	06 Feb 2009
286	1	06 Feb 2009	321	1	06 Feb 2009	356	1	06 Feb 2009
287	1	06 Feb 2009	322	1	06 Feb 2009	357	1	06 Feb 2009
288	1	06 Feb 2009	323	1	06 Feb 2009	358	1	06 Feb 2009
289	1	06 Feb 2009	324	1	06 Feb 2009	359	1	06 Feb 2009
290	1	06 Feb 2009	325	1	06 Feb 2009	360	1	06 Feb 2009
291	1	06 Feb 2009	326	1	06 Feb 2009	361	1	06 Feb 2009
292	1	06 Feb 2009	327	1	06 Feb 2009	362	1	06 Feb 2009
293	1	06 Feb 2009	328	1	06 Feb 2009	363	1	06 Feb 2009
294	1	06 Feb 2009	329	1	06 Feb 2009	364	1	06 Feb 2009
295	1	06 Feb 2009	330	1	06 Feb 2009			
296	1	06 Feb 2009	331	1	06 Feb 2009			
297	1	06 Feb 2009	332	1	06 Feb 2009			
298	1	06 Feb 2009	333	1	06 Feb 2009			
299	1	06 Feb 2009	334	1	06 Feb 2009			
300	1	06 Feb 2009	335	1	06 Feb 2009			
301	1	06 Feb 2009	336	1	06 Feb 2009			
302	1	06 Feb 2009	337	1	06 Feb 2009			
303	1	06 Feb 2009	338	1	06 Feb 2009			
304	1	06 Feb 2009	339	1	06 Feb 2009			
305	1	06 Feb 2009	340	1	06 Feb 2009			
306	1	06 Feb 2009	341	1	06 Feb 2009			
307	1	06 Feb 2009	342	1	06 Feb 2009			
308	1	06 Feb 2009	343	1	06 Feb 2009			
309	1	06 Feb 2009	344	1	06 Feb 2009			
310	1	06 Feb 2009	345	1	06 Feb 2009			
311	1	06 Feb 2009	346	1	06 Feb 2009			
312	1	06 Feb 2009	347	1	06 Feb 2009			
313	1	06 Feb 2009	348	1	06 Feb 2009			
314	1	06 Feb 2009	349	1	06 Feb 2009			
315	1	06 Feb 2009	350	1	06 Feb 2009			
316	1	06 Feb 2009	351	1	06 Feb 2009			
317	1	06 Feb 2009	352	1	06 Feb 2009			

Approved by:

Marios Samprakos  
Head of Training

HCAA

Markos Tsaktanis  
Quality Manager



**TRAINING MANUAL  
PART 4  
Theoretical Knowledge  
Instruction**

Page: 6  
Revision: 1  
Date: 6 Feb 2009



## 4 Theoretical knowledge instruction

### 4.1 ATPL(A) Integrated Course

#### 4.1.1 Course Structure

The aim of Theoretical Knowledge Course (also referred as "Ground School") is to train pilots to the level of theoretical knowledge required for the ATPL (A) according to JAR-FCL 1.160. ATPL (A) theoretical knowledge course will comprise of fourteen (14) theoretical subjects, 750 hours of instruction, which includes formal classroom work, Bristol GS approved interactive video training, slide/tape presentation, and computer based training, progress tests, and sample exams. The applicant shall receive Bristol GS Course Manuals for the fourteen (14) subjects and a supplementary DVD that he will install on his personal computer that contains all the information on the manuals in computerized format along with a great number of animations and teaching modules. It also includes a section with all progress tests and a system that scores the tests and gives full feedback after scoring the test as an instructor would do. The theoretical knowledge course's syllabus, a further analysis on the teaching objectives and lectures' structure for each of the 14 subjects, is available in Appendix 1. The fourteen (14) subjects analyzed as follows:

	<b>Ground School Subject</b>	<b>Number of Lectures</b>	<b>Duration</b>	<b>Instructional Hours</b>
010	AIR LAW	10	3 weeks	50 hours
021	AIRCRAFT GENERAL KNOWLEDGE - AIRFRAME, SYSTEMS, POWER PLANT	14	4 weeks	70 hours
022	AIRCRAFT GENERAL KNOWLEDGE - INSTRUMENTS, ELECTRONICS	14	4 weeks	70 hours
031	FLIGHT PERFORMANCE AND PLANNING - MASS AND BALANCE	8	2 weeks	40 hours
032	PERFORMANCE	12	3 weeks	60 hours
033	FLIGHT PLANNING AND MONITORING	12	3 weeks	60 hours
040	HUMAN PERFORMANCE AND LIMITATIONS	12	3 weeks	60 hours
050	METEOROLOGY	16	4 weeks	80 hours
061	GENERAL NAVIGATION	14	4 weeks	70 hours
062	RADIO NAVIGATION	14	4 weeks	70 hours
070	OPERATIONAL PROCEDURES	6	2 weeks	30 hours
081	PRINCIPLES OF FLIGHT	12	3 weeks	60 hours
091	VFR COMMUNICATIONS	3	1 week	15 hours
092	IFR COMMUNICATIONS	3	1 week	15 hours
	<b>TOTAL Residential Ground School</b>	<b>150</b>	<b>41 weeks</b>	<b>750 hours</b>

## 4.2 CPL/IR(A) Integrated Course

### 4.2.1 Course Structure

The aim of Theoretical Knowledge Course (also referred as "Ground School") is to train pilots to the level of theoretical knowledge required for the CPL/IR (A) according to JAR-FCL 1.160. CPL/IR (A) theoretical knowledge course will comprise of fourteen (14) theoretical subjects, 750 hours of instruction, which includes formal classroom work, Bristol GS approved interactive video training, slide/tape presentation, and computer based training, progress tests, and sample exams. The applicant shall receive Bristol GS Course Manuals for the fourteen (14) subjects and a supplementary DVD that he will install on his personal computer that contains all the information on the manuals in computerized format along with a great number of animations and teaching modules. It also includes a section with all progress tests and a system that scores the tests and gives full feedback after scoring the test as an instructor would do. The theoretical knowledge course's syllabus, a further analysis on the teaching objectives and lectures' structure for each of the 14 subjects, is available in Appendix 1. The fourteen (14) subjects analyzed as follows:

	<b>Ground School Subject</b>	<b>Number of Lectures</b>	<b>Duration</b>	<b>Instructional Hours</b>
010	AIR LAW	10	3 weeks	50 hours
021	AIRCRAFT GENERAL KNOWLEDGE - AIRFRAME, SYSTEMS, POWER PLANT	14	4 weeks	70 hours
022	AIRCRAFT GENERAL KNOWLEDGE - INSTRUMENTS, ELECTRONICS	14	4 weeks	70 hours
031	FLIGHT PERFORMANCE AND PLANNING - MASS AND BALANCE	8	2 weeks	40 hours
032	PERFORMANCE	12	3 weeks	60 hours
033	FLIGHT PLANNING AND MONITORING	12	3 weeks	60 hours
040	HUMAN PERFORMANCE AND LIMITATIONS	12	3 weeks	60 hours
050	METEOROLOGY	16	4 weeks	80 hours
061	GENERAL NAVIGATION	14	4 weeks	70 hours
062	RADIO NAVIGATION	14	4 weeks	70 hours
070	OPERATIONAL PROCEDURES	6	2 weeks	30 hours
081	PRINCIPLES OF FLIGHT	12	3 weeks	60 hours
091	VFR COMMUNICATIONS	3	1 week	15 hours
092	IFR COMMUNICATIONS	3	1 week	15 hours
	<b>TOTAL Residential Ground School</b>	<b>150</b>	<b>41 weeks</b>	<b>750 hours</b>

### 4.3 CPL(A) Integrated Course

#### 4.3.1 Course Structure

The aim of Theoretical Knowledge Course (also referred as "Ground School") is to train pilots to the level of theoretical knowledge required for the CPL/IR (A) according to JAR-FCL 1.160. CPL (A) theoretical knowledge course will comprise of fourteen (14) theoretical subjects, 750 hours of instruction, which includes formal classroom work, Bristol GS approved inter-active video training, slide/tape presentation, and computer based training, progress tests, and sample exams. The applicant shall receive Bristol GS Course Manuals for the fourteen (14) subjects and a supplementary DVD that he will install on his personal computer that contains all the information on the manuals in computerized format along with a great number of animations and teaching modules. It also includes a section with all progress tests and a system that scores the tests and gives full feedback after scoring the test as an instructor would do. The theoretical knowledge course's syllabus, a further analysis on the teaching objectives and lectures' structure for each of the 14 subjects, is available in Appendix 1. The fourteen (14) subjects analyzed as follows:

	<b>Ground School Subject</b>	<b>Number of Lectures</b>	<b>Duration</b>	<b>Instructional Hours</b>
010	AIR LAW	10	3 weeks	50 hours
021	AIRCRAFT GENERAL KNOWLEDGE - AIRFRAME, SYSTEMS, POWER PLANT	14	4 weeks	70 hours
022	AIRCRAFT GENERAL KNOWLEDGE - INSTRUMENTS, ELECTRONICS	14	4 weeks	70 hours
031	FLIGHT PERFORMANCE AND PLANNING - MASS AND BALANCE	8	2 weeks	40 hours
032	PERFORMANCE	12	3 weeks	60 hours
033	FLIGHT PLANNING AND MONITORING	12	3 weeks	60 hours
040	HUMAN PERFORMANCE AND LIMITATIONS	12	3 weeks	60 hours
050	METEOROLOGY	16	4 weeks	80 hours
061	GENERAL NAVIGATION	14	4 weeks	70 hours
062	RADIO NAVIGATION	14	4 weeks	70 hours
070	OPERATIONAL PROCEDURES	6	2 weeks	30 hours
081	PRINCIPLES OF FLIGHT	12	3 weeks	60 hours
091	VFR COMMUNICATIONS	3	1 week	15 hours
092	IFR COMMUNICATIONS	3	1 week	15 hours
	<b>TOTAL Residential Ground School</b>	<b>150</b>	<b>41 weeks</b>	<b>750 hours</b>

## 4.4 CPL(A) Modular Course

### 4.4.1 Course Structure

The aim of Theoretical Knowledge Course (also referred as "Ground School") is to train pilots to the level of theoretical knowledge required for the CPL (A) according to JAR-FCL 1.160. Applicants for this course have a choice between Residential and Distance Learning Theoretical Training courses. CPL (A) theoretical knowledge course will comprise of fourteen (14) theoretical subjects, 750 hours of instruction, which includes formal classroom work, Bristol GS approved inter-active video training, slide/tape presentation, and computer based training, progress tests, and sample exams. The applicant shall receive Bristol GS Course Manuals for the fourteen (14) subjects and a supplementary DVD that he will install on his personal computer that contains all the information on the manuals in computerized format along with a great number of animations and teaching modules. It also includes a section with all progress tests and a system that scores the tests and gives full feedback after scoring the test as an instructor would do. The theoretical knowledge course's syllabus, a further analysis on the teaching objectives and lectures' structure for each of the 14 subjects, is available in Appendix 1. The fourteen (14) subjects analyzed as follows:

	<b>Ground School Subject</b>	<b>Number of Lectures</b>	<b>Duration</b>	<b>Instructional Hours</b>
010	AIR LAW	10	3 weeks	50 hours
021	AIRCRAFT GENERAL KNOWLEDGE - AIRFRAME, SYSTEMS, POWER PLANT	14	4 weeks	70 hours
022	AIRCRAFT GENERAL KNOWLEDGE - INSTRUMENTS, ELECTRONICS	14	4 weeks	70 hours
031	FLIGHT PERFORMANCE AND PLANNING - MASS AND BALANCE	8	2 weeks	40 hours
032	PERFORMANCE	12	3 weeks	60 hours
033	FLIGHT PLANNING AND MONITORING	12	3 weeks	60 hours
040	HUMAN PERFORMANCE AND LIMITATIONS	12	3 weeks	60 hours
050	METEOROLOGY	16	4 weeks	80 hours
061	GENERAL NAVIGATION	14	4 weeks	70 hours
062	RADIO NAVIGATION	14	4 weeks	70 hours
070	OPERATIONAL PROCEDURES	6	2 weeks	30 hours
081	PRINCIPLES OF FLIGHT	12	3 weeks	60 hours
091	VFR COMMUNICATIONS	3	1 week	15 hours
092	IFR COMMUNICATIONS	3	1 week	15 hours
	<b>TOTAL Residential Ground School</b>	<b>150</b>	<b>41 weeks</b>	<b>750 hours</b>

#### Distance Learning Course

Distance learning (correspondence) course is also offered for this course. In this case, the applicant will be using additional software in order to be capable to submit all progress tests, using the internet, to a well organized Data Base that stores the tests sorted by applicant name, subject and date of the test.

An automated system is integrated with the Data Base and gives the required feedback to the CGI and to ground instructors.



**TRAINING MANUAL  
PART 4  
Theoretical Knowledge  
Instruction**

Page: 11  
Revision: 1  
Date: 6 Feb 2009

Additionally, using this system a variety of statistical data concerning the progress of each individual applicant and a trend analysis of the training provided is available.

An applicant following distance learning course also has formal classroom instruction for each subject. The amount of time spent in actual classroom instruction is 10% of the total duration of each subject.

## 4.5 ATPL(A) Modular Course

### 4.5.1 Course Structure

The aim of Theoretical Knowledge Course (also referred as "Ground School") is to train pilots to the level of theoretical knowledge required for the ATPL (A) according to JAR-FCL 1.160. ATPL (A) theoretical knowledge course will comprise of fourteen (14) theoretical subjects, 750 hours of instruction, which includes formal classroom work, Bristol GS approved interactive video training, slide/tape presentation, and computer based training, progress tests, and sample exams. The applicant shall receive Bristol GS Course Manuals for the fourteen (14) subjects and a supplementary DVD that he will install on his personal computer that contains all the information on the manuals in computerized format along with a great number of animations and teaching modules. It also includes a section with all progress tests and a system that scores the tests and gives full feedback after scoring the test as an instructor would do. The theoretical knowledge course's syllabus, a further analysis on the teaching objectives and lectures' structure for each of the 14 subjects, is available in Appendix 1. The fourteen (14) subjects analyzed as follows:

Ground School Subject		Number of Lectures	Duration	Instructional Hours
010	AIR LAW	10	3 weeks	50 hours
021	AIRCRAFT GENERAL KNOWLEDGE - AIRFRAME, SYSTEMS, POWER PLANT	14	4 weeks	70 hours
022	AIRCRAFT GENERAL KNOWLEDGE - INSTRUMENTS, ELECTRONICS	14	4 weeks	70 hours
031	FLIGHT PERFORMANCE AND PLANNING - MASS AND BALANCE	8	2 weeks	40 hours
032	PERFORMANCE	12	3 weeks	60 hours
033	FLIGHT PLANNING AND MONITORING	12	3 weeks	60 hours
040	HUMAN PERFORMANCE AND LIMITATIONS	12	3 weeks	60 hours
050	METEOROLOGY	16	4 weeks	80 hours
061	GENERAL NAVIGATION	14	4 weeks	70 hours
062	RADIO NAVIGATION	14	4 weeks	70 hours
070	OPERATIONAL PROCEDURES	6	2 weeks	30 hours
081	PRINCIPLES OF FLIGHT	12	3 weeks	60 hours
091	VFR COMMUNICATIONS	3	1 week	15 hours
092	IFR COMMUNICATIONS	3	1 week	15 hours
<b>TOTAL Residential Ground School</b>		<b>150</b>	<b>41 weeks</b>	<b>750 hours</b>

#### Distance Learning Course

Distance learning (correspondence) course is also offered for this course. In this case, the applicant will be using additional software in order to be capable to submit all progress tests, using the internet, to a well organized Data Base that stores the tests sorted by applicant name, subject and date of the test.

An automated system is integrated with the Data Base and gives the required feedback to the CGI and to ground instructors.



**TRAINING MANUAL  
PART 4  
Theoretical Knowledge  
Instruction**

Page: 13  
Revision: 1  
Date: 6 Feb 2009

Additionally, using this system a variety of statistical data concerning the progress of each individual applicant and a trend analysis of the training provided is available.

An applicant following distance learning course also has formal classroom instruction for each subject. The amount of time spent in actual classroom instruction is 10% of the total duration of each subject.

## 4.6 PPL(A) Course

### 4.6.1 Course Structure

The aim of Theoretical Knowledge Course (also referred as "Ground School") is to train pilots to the level of theoretical knowledge required for the PPL (A) according to JAR-FCL 1.125. PPL (A) theoretical knowledge course will comprise of nine (9) theoretical subjects, 80 hours of instruction, which includes formal classroom work, approved inter-active video training, slide/tape presentation, and computer based training. All teaching for the purpose of this course is conducted in English. The theoretical knowledge course's syllabus, a further analysis on the teaching objectives and lectures' structure for each of the 9 subjects, is available in Appendix 2. The theoretical subjects analyzed as follows:

	<b>Ground School Subject</b>	<b>Number of Lectures</b>	<b>Duration</b>	<b>Instructional Hours</b>
010	AIR LAW	2	½ week	5 hours
020	AIRCRAFT GENERAL KNOWLEDGE	4	1 week	10 hours
030	FLIGHT PERFORMANCE AND PLANNING	4	1 week	10 hours
040	HUMAN PERFORMANCE AND LIMITATIONS	2	½ week	5 hours
050	METEOROLOGY	4	1 week	10 hours
060	NAVIGATION	8	2 weeks	20 hours
070	OPERATIONAL PROCEDURES	2	½ week	5 hours
081	PRINCIPLES OF FLIGHT	4	1 week	10 hours
090	COMMUNICATIONS	2	½ week	5 hours
	<b>TOTAL Residential Ground School</b>	<b>32</b>	<b>8 weeks</b>	<b>80 hours</b>

#### Distance learning

Distance learning (correspondence) course is also offered for this course. In this case, the applicant will be using additional software in order to be capable to obtain the necessary level of theoretical knowledge required for the PPL (A) according to JAR-FCL 1.125.



## 4.7 IR(A) Modular Training Course

### 4.7.1 Course Structure

The aim of Theoretical Knowledge Course (also referred as "Ground School") is to train pilots to the level of theoretical knowledge required for the IR (A) according to JAR-FCL 1.205. IR (A) theoretical knowledge course will comprise of nine (9) theoretical subjects, 545 hours of instruction, which includes formal classroom work, Bristol GS approved inter-active video training, slide/tape presentation, and computer based training, progress tests, and sample exams. The applicant shall receive Bristol GS Course Manuals for the nine (9) subjects and a supplementary DVD that he will install on his personal computer that contains all the information on the manuals in computerized format along with a great number of animations and teaching modules. It also includes a section with all progress tests and a system that scores the tests and gives full feedback after scoring the test as an instructor would do. The theoretical knowledge course's syllabus, a further analysis on the teaching objectives and lectures' structure for each of the 9 subjects, is available in Appendix 1. The nine (9) subjects analyzed as follows:

	<b>Ground School Subject</b>	<b>Number of Lectures</b>	<b>Duration</b>	<b>Instructional Hours</b>
010	AIR LAW	10	3 weeks	50 hours
021	AIRCRAFT GENERAL KNOWLEDGE - AIRFRAME, SYSTEMS, POWER PLANT	14	4 weeks	70 hours
022	AIRCRAFT GENERAL KNOWLEDGE - INSTRUMENTS, ELECTRONICS	14	4 weeks	70 hours
033	FLIGHT PLANNING AND MONITORING	12	3 weeks	60 hours
040	HUMAN PERFORMANCE AND LIMITATIONS	12	3 weeks	60 hours
050	METEOROLOGY	16	4 weeks	80 hours
061	GENERAL NAVIGATION	14	4 weeks	70 hours
062	RADIO NAVIGATION	14	4 weeks	70 hours
092	IFR COMMUNICATIONS	3	1 week	15 hours
	<b>TOTAL Residential Ground School</b>	<b>109</b>	<b>30 weeks</b>	<b>545 hours</b>

#### Distance Learning Course

Distance learning (correspondence) course is also offered for this course. In this case, the applicant will be using additional software in order to be capable to submit all progress tests, using the internet, to a well organized Data Base that stores the tests sorted by applicant name, subject and date of the test.

An automated system is integrated with the Data Base and gives the required feedback to the CGI and to ground instructors.

Additionally, using this system a variety of statistical data concerning the progress of each individual applicant and a trend analysis of the training provided is available.

An applicant following distance learning course also has formal classroom instruction for each subject. The amount of time spent in actual classroom instruction is 10% of the total duration of each subject.

## 4.8 Single Pilot Multi Engine Class Rating (SP/ME(A))

### 4.8.1 Course Structure

The aim of Theoretical Knowledge Course (also referred as "Ground School") is to train pilots to the level of theoretical knowledge required for the MEP (A) rating according to JAR-FCL 1.261(a)(2).

The theoretical knowledge instruction is conducted by an authorised instructor holding the appropriate class rating or any instructor having appropriate experience in aviation and knowledge of the aircraft concerned, e.g. flight engineer, maintenance engineer, flight operations officer. The theoretical knowledge course's syllabus, a further analysis on the teaching objectives and lectures' structure for each of the subjects, is available in Appendix 3.

The theoretical knowledge instruction is covering the syllabus in AMC FCL 1.261(a), as appropriate to the aeroplane class concerned. Depending on the equipment and systems installed, the instruction shall include but is not limited to the following content:

Ground School Subject	Number of Lectures	Duration	Instructional Hours
Aeroplane structure and equipment, normal operation of systems and malfunctions	1	1 day	2 hours
Limitations			1 hour
Performance, flight planning and monitoring			2 hours
Load, balance and servicing	1	1 day	1 hour
Emergency procedures			2 hours
Special requirements for "glass cockpit" aeroplanes			2 hours
<b>TOTAL Residential Ground School</b>	<b>2</b>	<b>2 days</b>	<b>10 hours</b>

## 4.9 Flight Instructor Rating (Aeroplanes) FI(A) Course

### 4.9.1 Course Structure

The aim of Theoretical Knowledge Course (also referred as "Ground School") is to train pilots to the level of theoretical knowledge required for the FI (A) according to JAR-FCL 1.340. The theoretical knowledge course's syllabus, a further analysis on the teaching objectives and lectures' structure for each of the subjects, is available in Appendix 4.

The FI(A) course should give particular stress to the role of the individual in relation to the importance of human factors in the man-machine and theoretical knowledge environment interaction. Special attention is paid to the applicant's maturity and judgement including an understanding of adults, their behavioural attitudes and variable levels of education.

With the exception of the section on Teaching and Learning, all the subject detail contained in the Ground and Flight Training Syllabus is complementary to the PPL (A) course syllabus and should already be known by the applicant. Therefore the purpose of the course is to:

- refresh and bring up to date the technical knowledge of the student instructor
- train the student instructor to teach the ground subjects and air exercises
- ensure that the student instructor's flying is of a sufficiently high standard; and
- teach the student instructor the principles of basic instruction and to apply them at the PPL level.

During the course, the applicants should be made aware of their own attitudes to the importance of flight safety. Improving safety awareness should be a fundamental objective throughout the course. It will be of major importance for the course to aim at giving applicants the knowledge, skills and attitudes relevant to a flight instructor's task and comprise at least of the following areas:

Ground School Subject	Number of Lectures	Duration	Instructional Hours
THE LEARNING PROCESS	5	1 weeks	25 hours
THE TEACHING PROCESS	5	1 weeks	25 hours
TRAINING PHILOSOPHIES	1		4 hours
TECHNIQUES OF APPLIED INSTRUCTION	2	1 week	8 hours
STUDENT EVALUATION AND TESTING	1		4 hours
TRAINING PROGRAMME DEVELOPMENT	1		4 hours
HUMAN PERFORMANCE AND LIMITATIONS RELEVANT TO FLIGHT INSTRUCTION	2	1 week	8 hours
HAZARDS INVOLVED IN SIMULATING SYSTEMS FAILURES AND MALFUNCTIONS IN THE AEROPLANE DURING FLIGHT	3		12 hours
NIGHT FLYING INSTRUCTION	2	1 week	8 hours
TRAINING ADMINISTRATION	3		12 hours
PPL SYLLABUS	3	1 week	12 hours
PRINCIPLES OF FLIGHT RELEVANT TO PPL SYLLABUS	2		8 hours
<b>TOTAL Residential Ground School</b>	<b>30</b>	<b>6 weeks</b>	<b>130 hours</b>

## 4.10 Class rating instructor rating – aeroplane (CRI(A)).

### 4.10.1 Course Structure

The aim of Theoretical Knowledge Course (also referred as “Ground School”) is to train pilots to the level of theoretical knowledge required for the CRI (A) according to JAR-FCL 1.380. The theoretical knowledge course’s syllabus, a further analysis on the teaching objectives and lectures’ structure, is available in Appendix 5.

This syllabus is concerned only with the training on multi-engine aeroplanes. Therefore, other knowledge areas, common to both single- and multi-engine aeroplanes, is revised as necessary to cover the handling and operating of the aeroplane with all engines operative, using the applicable sections of the Ground Subjects Syllabus for the flight instructor course (AMC FCL 1.340). Additionally, the ground training is including 25 hours of classroom work to develop the applicant’s ability to teach a student the knowledge and understanding required for the air exercise section of the multi-engine training course. This part also is including the long briefings for the air exercises.

The CRI(A) course is giving particular stress to the role of the individual in relation to the importance of human factors in the man-machine and theoretical knowledge environment interaction. Special attention is paid to the applicant’s maturity and judgement including an understanding of adults, their behavioural attitudes and variable levels of education.

During the course, the applicants should be made aware of their own attitudes to the importance of flight safety. Improving safety awareness should be a fundamental objective throughout the course. It will be of major importance for the course of training to aim at giving applicants the knowledge, skills and attitudes relevant to a flight instructor’s task and to achieve this course curriculum, in terms of goals and objectives, comprise at least the following areas:

#### PART 1 TEACHING AND LEARNING

Ground School Subject	Number of Lectures	Duration	Instructional Hours
THE LEARNING PROCESS	5	1 weeks	25 hours
THE TEACHING PROCESS	5	1 weeks	25 hours
TRAINING PHILOSOPHIES	1		4 hours
TECHNIQUES OF APPLIED INSTRUCTION	2	1 week	8 hours
STUDENT EVALUATION AND TESTING	1		4 hours
TRAINING PROGRAMME DEVELOPMENT	1		4 hours
HUMAN PERFORMANCE AND LIMITATIONS RELEVANT TO FLIGHT INSTRUCTION	2		8 hours
HAZARDS INVOLVED IN SIMULATING SYSTEMS FAILURES AND MALFUNCTIONS IN THE AEROPLANE DURING FLIGHT	2	1 week	12 hours
TRAINING ADMINISTRATION	1		5 hours
<b>TOTAL Residential Ground School</b>	<b>20</b>	<b>4 weeks</b>	<b>95 hours</b>

PART 2 THEORETICAL KNOWLEDGE INSTRUCTION SYLLABUS

<b>Ground School Subject</b>	<b>Number of Lectures</b>	<b>Duration</b>	<b>Instructional Hours</b>
AVIATION LEGISLATION	1		2 hours
PERFORMANCE, ALL ENGINES OPERATING, INCLUDING MASS AND BALANCE	1		3 hours
ASYMMETRIC FLIGHT - PRINCIPLES OF FLIGHT	1		2 hours
CONTROL IN ASYMMETRIC FLIGHT MINIMUM CONTROL AND SAFETY SPEEDS FEATHERING AND UNFEATHERING	1	1 week	3 hours
PERFORMANCE IN ASYMMETRIC FLIGHT	1		3 hours
SPECIFIC TYPE OF AEROPLANE – OPERATION OF SYSTEMS. AIRFRAME AND ENGINE LIMITATIONS	1		3 hours
BRIEFINGS FOR AIR EXERCISES PROGRESS	1		9 hours
<b>TOTAL Residential Ground School</b>	<b>7</b>	<b>1 week</b>	<b>25 hours</b>

Note: Total 25 hours including progress test

## 4.11 Instrument rating instructor rating (Aeroplane) (IRI(A))

### 4.11.1 Course Structure

The aim of Theoretical Knowledge Course (also referred as "Ground School") is to train pilots to the level of theoretical knowledge required for the IRI (A) according to JAR-FCL 1.395. The theoretical knowledge course's syllabus, a further analysis on the teaching objectives and lectures' structure, is available in Appendix 6.

With the exception of the section on Teaching and Learning, all the subject detail contained in the theoretical and Flight Training Syllabus is complementary to the Instrument Rating Pilot Course Syllabus which should already be known by the applicant. Therefore the objective of the course is to:

- ✓ refresh and bring up to date the technical knowledge of the student instructor
- ✓ train pilots in accordance with the requirements of the modular instrument flying training course (Appendix 1 to JAR-FCL 1.210)
- ✓ enable the applicant to develop the necessary instructional techniques required for teaching of instrument flying, radio navigation and instrument procedures to the level required for the issue of an instrument rating and
- ✓ ensure that the student instrument rating instructor's flying is of a sufficiently high standard.

The IRI (A) course is giving particular stress to the role of the individual in relation to the importance of human factors in the man-machine and theoretical knowledge environment interaction. Special attention is paid to the applicant's maturity and judgement including an understanding of adults, their behavioural attitudes and variable levels of education.

During the course, the applicants should be made aware of their own attitudes to the importance of flight safety. Improving safety awareness should be a fundamental objective throughout the course. It will be of major importance for the course of training to aim at giving applicants the knowledge, skills and attitudes relevant to a flight instructor's task and to achieve this course curriculum, in terms of goals and objectives, comprise at least the following areas: (The holder of a FI(A) rating is exempted from Part One (Teaching and learning) from this course).

### PART 1 TEACHING AND LEARNING

Ground School Subject	Number of Lectures	Duration	Instructional Hours
THE LEARNING PROCESS	5	1 weeks	25 hours
THE TEACHING PROCESS	5	1 weeks	25 hours
TRAINING PHILOSOPHIES	1		4 hours
TECHNIQUES OF APPLIED INSTRUCTION	2	1 week	8 hours
STUDENT EVALUATION AND TESTING	1		4 hours
TRAINING PROGRAMME DEVELOPMENT	1		4 hours
HUMAN PERFORMANCE AND LIMITATIONS RELEVANT TO FLIGHT INSTRUCTION	2		8 hours
HAZARDS INVOLVED IN SIMULATING SYSTEMS FAILURES AND MALFUNCTIONS IN THE AEROPLANE DURING FLIGHT	2	1 week	12 hours
TRAINING ADMINISTRATION	1		5 hours
<b>TOTAL Residential Ground School</b>	<b>20</b>	<b>4 weeks</b>	<b>95 hours</b>

PART 2 THEORETICAL KNOWLEDGE INSTRUCTION SYLLABUS

<b>Ground School Subject</b>	<b>Number of Lectures</b>	<b>Duration</b>	<b>Instructional Hours</b>
PHYSIOLOGICAL/PSYCHOLOGICAL FACTORS	1	1 week	2 hours
FLIGHT INSTRUMENTS	1		3 hours
RADIO NAVIGATION AIDS	1		3 hours
AERONAUTICAL INFORMATION PUBLICATIONS	1		2 hours
FLIGHT PLANNING GENERAL	1		3 hours
THE PRIVILEGES OF THE INSTRUMENT RATING	1		3 hours
BRIEFINGS FOR AIR EXERCISES PROGRESS	1		9 hours
<b>TOTAL Residential Ground School</b>	<b>7</b>	<b>1 week</b>	<b>25 hours</b>

Note: Total 25 hours including progress test

## **4.12 Flight Instructor (FI)/Instrument Rating Instructor (IRI)/Class Rating Instructor (CRI) refresher seminar**

### **4.12.1 Course Structure**

The ground training also referred as "Refresher Seminar", consists of all instruction given on the ground for the purpose of the course by an appointed competent person, and includes classroom lectures, tutorials, long briefings and directed private study. The theoretical knowledge course's syllabus, a further analysis on the teaching objectives and lectures' structure, is available in Appendix 7.

The content of the FI/IRI/CRI refresher seminar are selected from the following subjects:

- ✓ new and/or current rules/regulations, with emphasis on knowledge of JAR-FCL and JAR-OPS requirements
- ✓ teaching and learning
- ✓ instructional techniques
- ✓ the role of the instructor
- ✓ national regulations (as applicable)
- ✓ human factors
- ✓ flight safety, incident and accident prevention
- ✓ airmanship
- ✓ legal aspects and enforcement procedures
- ✓ navigational skills including new/current radio navigation aids
- ✓ teaching instrument flying; and
- ✓ weather related topics including methods of distribution.
- ✓ ASYMMETRIC POWER FLIGHT (for CRI's)

The course is giving particular stress to the role of the individual in relation to the importance of human factors in the man-machine and theoretical knowledge environment interaction. Special attention is paid to the applicant's maturity and judgement including an understanding of adults, their behavioural attitudes and variable levels of education.

During the course, the applicants should be made aware of their own attitudes to the importance of flight safety. Improving safety awareness should be a fundamental objective throughout the course. It will be of major importance for the course of training to aim at giving applicants the knowledge, skills and attitudes relevant to a flight instructor's task and to achieve this course curriculum, in terms of goals and objectives, comprise at least the following areas:.



DAY 1 TEACHING AND LEARNING

<b>Ground School Subject</b>	<b>Instructional Hours</b>
THE LEARNING PROCESS	1 hour
THE TEACHING PROCESS	1 hour
TRAINING PHILOSOPHIES	1 hour
TECHNIQUES OF APPLIED INSTRUCTION	
STUDENT EVALUATION AND TESTING	1 hour
TRAINING PROGRAMME DEVELOPMENT	
HUMAN PERFORMANCE AND LIMITATIONS RELEVANT TO FLIGHT INSTRUCTION	1 hour
HAZARDS INVOLVED IN SIMULATING SYSTEMS FAILURES AND MALFUNCTIONS IN THE AEROPLANE DURING FLIGHT	1 hour
TRAINING ADMINISTRATION	1 hour
<b>TOTAL Residential Ground School</b>	<b>7 hours</b>

DAY 2 THEORETICAL KNOWLEDGE INSTRUCTION SYLLABUS

<b>Ground School Subject</b>	<b>Relevant Courses</b>	<b>Instructional Hours</b>
FLIGHT INSTRUMENTS	FI, IRI	1 hour
RADIO NAVIGATION AIDS	FI, IRI	
AERONAUTICAL INFORMATION PUBLICATIONS	ALL	1 hour
FLIGHT PLANNING GENERAL	ALL	
THE PRIVILEGES OF THE INSTRUMENT RATING	IRI	1 hour
AVIATION LEGISLATION	ALL	
BRIEFINGS FOR AIR EXERCISES PROGRESS	ALL	1 hour
PERFORMANCE, ALL ENGINES OPERATING, INCLUDING MASS AND BALANCE	CRI	1 hour
ASYMMETRIC FLIGHT - PRINCIPLES OF FLIGHT	CRI	
CONTROL IN ASYMMETRIC FLIGHT MINIMUM CONTROL AND SAFETY SPEEDS FEATHERING AND UNFEATHERING	CRI	1 hour
PERFORMANCE IN ASYMMETRIC FLIGHT	CRI	
PPL SYLLABUS	FI	1 hour
PRINCIPLES OF FLIGHT RELEVANT TO PPL SYLLABUS	FI	1 hour
<b>TOTAL Residential Ground School</b>		<b>8 hours</b>

### **4.13 Instrument Rating (IR(A)) / Class Rating (MEP(A)) refresher seminar**

#### **4.13.1 Course Structure**

The ground training also referred as "Refresher Seminar", consists of all instruction given on the ground for the purpose of the course by an appointed competent person, and includes classroom lectures, tutorials, long briefings and directed private study. The theoretical knowledge course's syllabus, a further analysis on the teaching objectives and lectures' structure, for the IR(A) refresh seminar is available in Appendix 8 and the equivalent for the MEP(A) refresh seminar is available in Appendix 9.

The content of the IR(A) and MEP(A) refresher seminar are selected from the following subjects:

- ✓ new and/or current rules/regulations, with emphasis on knowledge of JAR-FCL and JAR-OPS requirements
- ✓ national regulations (as applicable)
- ✓ flight safety, incident and accident prevention
- ✓ airmanship
- ✓ legal aspects and enforcement procedures
- ✓ navigational skills including new/current radio navigation aids
- ✓ weather related topics including methods of distribution.
- ✓ ASYMMETRIC POWER FLIGHT (for CRI's)

#### IR(A) Refresher Training

<b>Ground School Subject</b>	<b>Instructional Hours</b>
FLIGHT INSTRUMENTS	1 Hour
RADIO NAVIGATION AIDS	0:45 Hour
AERONAUTICAL INFORMATION PUBLICATIONS	1 Hour
FLIGHT PLANNING GENERAL	0:45 Hour
THE PRIVILEGES OF THE INSTRUMENT RATING	0:45 Hour
AVIATION LEGISLATION	0:45 Hour
<b>TOTAL Residential Ground School</b>	<b>5 Hours</b>



**TRAINING MANUAL  
PART 4  
Theoretical Knowledge  
Instruction**

Page: 25  
Revision: 1  
Date: 6 Feb 2009

MEP(A) Refresher Training

<b>Ground School Subject</b>	<b>Instructional Hours</b>
FLIGHT PLANNING GENERAL	1 Hours
AVIATION LEGISLATION	0:45 Hour
PERFORMANCE, ALL ENGINES OPERATING, INCLUDING MASS AND BALANCE	0:45 Hour
ASYMMETRIC FLIGHT - PRINCIPLES OF FLIGHT	1 Hour
CONTROL IN ASYMMETRIC FLIGHT MINIMUM CONTROL AND SAFETY SPEEDS FEATHERING AND UNFEATHERING	0:45 Hour
PERFORMANCE IN ASYMMETRIC FLIGHT	0:45 Hour
<b>TOTAL Residential Ground School</b>	<b>5 Hours</b>

## **4.14 Night Qualification (JAR-FCL 1.125(c))**

### **4.14.1 Course Structure**

The ground training also consists of all instruction given on the ground for the purpose of the course by an appointed competent person, and includes classroom lectures, tutorials, long briefings and directed private study.

During the training the applicant should be familiar with the following items:

- ✓ Legislation requirements
- ✓ Aeroplane equipment
- ✓ Aeroplane lights
- ✓ Flight crew licences
- ✓ Aerodrome licences (if applicable)
- ✓ Night familiarisation
- ✓ Preparation for flight
- ✓ Equipment required for flight
- ✓ Night vision accommodation
- ✓ Personal safety precautions in the parking areas
- ✓ External/internal checks – night considerations
- ✓ Aeroplane lights – operation

## **APPENDIX 1**

<b>Ground School Subject</b>	
010	AIR LAW
021	AIRCRAFT GENERAL KNOWLEDGE - AIRFRAME, SYSTEMS, POWER PLANT
022	AIRCRAFT GENERAL KNOWLEDGE - INSTRUMENTS, ELECTRONICS
031	FLIGHT PERFORMANCE AND PLANNING - MASS AND BALANCE
032	PERFORMANCE
033	FLIGHT PLANNING AND MONITORING
040	HUMAN PERFORMANCE AND LIMITATIONS
050	METEOROLOGY
061	GENERAL NAVIGATION
062	RADIO NAVIGATION
070	OPERATIONAL PROCEDURES
081	PRINCIPLES OF FLIGHT
091	VFR COMMUNICATIONS
092	IFR COMMUNICATIONS



**TRAINING MANUAL  
PART 4  
Theoretical Knowledge  
Instruction**

Page: 28  
Revision: 1  
Date: 6 Feb 2009

<b>SUBJECT DETAILS</b>	
<b>010</b>	<b>AIR LAW</b>
INSTRUCTIONAL HOURS:	<b>50</b>
NUMBER OF LECTURES:	<b>10</b>
LECTURE DURATION (WITHOUT BREAK):	<b>5</b>
NUMBER OF PROGRESS TESTS (MINIMUM):	<b>2</b>
NUMBER OF SAMPLE EXAMS (MINIMUM):	<b>1</b>
<b>GENERAL DESCRIPTION &amp; OBJECTIVES OF SUBJECT TRAINING</b>	
<ul style="list-style-type: none"> <li>✓ UNDERSTANDING THE FRAMEWORK</li> <li>✓ ICAO AND THE CHICAGO CONVENTION</li> <li>✓ THE 1944 CHICAGO CONVENTION</li> <li>✓ OTHER CONVENTIONS AND AGREEMENTS</li> <li>✓ ANNEX 1, PERSONNEL LICENSING</li> <li>✓ ANNEX 2, THE RULES OF THE AIR</li> <li>✓ ANNEX 7, REGISTRATION MARKS</li> <li>✓ ANNEX 8, AIRWORTHINESS OF AIRCRAFT</li> <li>✓ ANNEX 9, FACILITATION</li> <li>✓ ANNEX 11, AIR TRAFFIC SERVICES</li> <li>✓ ANNEX 12, SEARCH AND RESCUE</li> <li>✓ ANNEX 13, AIRCRAFT ACCIDENT INVESTIGATION</li> <li>✓ ANNEX 14, AERODROME</li> <li>✓ ANNEX 15, AERONAUTICAL INFORMATION SERVICE</li> <li>✓ ANNEX 17, SECURITY</li> <li>✓ THE OTHER ANNEXES</li> <li>✓ OTHER INTERNATIONALLY AGREED PROCEDURES</li> <li>✓ PANS-RAC</li> <li>✓ JAR - FCL 1</li> <li>✓ DOC 7030, THE EUR SECTION</li> <li>✓ ICAO AND JAA DEFINITIONS</li> </ul>	



**TRAINING MANUAL  
PART 4  
Theoretical Knowledge  
Instruction**

Page: 30  
Revision: 1  
Date: 6 Feb 2009

**INTENTIONALLY LEFT BLANK**



**LECTURE DETAILS**

SUBJECT TITLE:

**AIR LAW**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **1/10**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

UNDERSTANDING THE FRAMEWORK

- THE CONVENTION OF INTERNATIONAL CIVIL AVIATION
- THE INTERNATIONAL CIVIL AVIATION ORGANIZATION
- THE JOINT AVIATION AUTHORITY (JAA)

ICAO AND THE CHICAGO CONVENTION

- INTRODUCTION
- THE FIVE FREEDOMS
- THE STRUCTURE OF ICAO

THE 1944 CHICAGO CONVENTION

- THE ARTICLES OF THE CONVENTION
- GENERAL PRINCIPLES AND APPLICATION OF THE CONVENTION
- FLIGHT OVER TERRITORY OF CONTRACTING STATES
- MEASURES TO FACILITATE AIR NAVIGATION
- CONDITIONS TO BE FULFILLED WITH RESPECT TO AIRCRAFT
- INTERNATIONAL STANDARDS AND RECOMMENDED PRACTICES
- THE ORGANIZATION
- THE ASSEMBLY
- THE COUNCIL
- ANNEXES TO THE ICAO CONVENTION

OTHER CONVENTIONS AND AGREEMENTS

- THE CONVENTION OF TOKYO
- THE HAGUE CONVENTION
- THE MONTREAL CONVENTION
- THE WARSAW CONVENTION AND ASSOCIATED DOCUMENTS
- THE ROME CONVENTION
- AGREEMENT ON THE JOINT FINANCING OF CERTAIN AIR SERVICES

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>AIR LAW</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>2/10</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>ANNEX 1, PERSONNEL LICENSING</p> <ul style="list-style-type: none"> <li>➤ DEFINITIONS</li> </ul> <p>ANNEX 2, THE RULES OF THE AIR</p> <ul style="list-style-type: none"> <li>➤ APPLICABILITY OF THE RULES OF THE AIR</li> <li>➤ SIGNALS</li> <li>➤ MARSHALLING SIGNALS</li> <li>➤ INTERCEPTION</li> <li>➤ PRINCIPLES TO BE OBSERVED BY STATES</li> <li>➤ CRUISING LEVELS</li> </ul> <p>ANNEX 7, REGISTRATION MARKS</p> <ul style="list-style-type: none"> <li>➤ NATIONALITY, COMMON AND REGISTRATION MARKS TO BE USED</li> <li>➤ REGISTER OF NATIONALITY</li> </ul> <p>ANNEX 8, AIRWORTHINESS OF AIRCRAFT</p> <ul style="list-style-type: none"> <li>➤ APPLICABILITY</li> </ul>	

**LECTURE DETAILS**

SUBJECT TITLE:

**AIR LAW**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **3/10**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

ANNEX 9, FACILITATION

- THE AIM OF FACILITATION
- DEFINITIONS
- ENTRY AND DEPARTURE OF AIRCRAFT
- CLEARANCE AND SOJOURN OF AIRCRAFT
- ADVANCE NOTIFICATION OF ARRIVAL
- DESCRIPTION, PURPOSE AND USE OF AIRCRAFT DOCUMENTS
- DOCUMENTS REQUIRED FROM OUTBOUND AND INBOUND AIRCRAFT
- ENTRY AND DEPARTURE OF PERSONS AND THEIR BAGGAGE
- CREW AND OTHER OPERATORS' PERSONNEL
- UNACCOMPANIED BAGGAGE AND MAIL

ANNEX 11, AIR TRAFFIC SERVICES

- THE OBJECTIVES OF THE AIR TRAFFIC SERVICES
- DIVISIONS OF THE AIR TRAFFIC SERVICES
- MINIMUM FLIGHT ALTITUDES
- SERVICE TO AIRCRAFT IN THE EVENT OF AN EMERGENCY
- INTERCEPTION OF CIVIL AIRCRAFT
- TIME IN AIR TRAFFIC SERVICES
- AIR TRAFFIC CONTROL SERVICE
- APPLICATION
- PROVISION OF AIR TRAFFIC SERVICES
- OPERATION OF AIR TRAFFIC CONTROL SERVICE
- SEPARATION
- SEPARATION MINIMA
- CONTENTS OF CLEARANCES
- CONTROL OF PERSONS AND VEHICLES AT AERODROMES
- FLIGHT INFORMATION SERVICE
- APPLICATION
- SCOPE OF FLIGHT INFORMATION SERVICE
- FIS BROADCASTS

**LECTURE DETAILS**

SUBJECT TITLE:

**AIR LAW**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **4/10**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

**ANNEX 12, SEARCH AND RESCUE**

- ORGANIZATION
- ESTABLISHMENT AND PROVISION OF SAR SERVICE
- ESTABLISHMENT OF SAR REGIONS
- CO-OPERATION
- CO-OPERATION BETWEEN STATES
- CO-OPERATION WITH OTHER SERVICES
- OPERATING PROCEDURES
- PROCEDURES FOR PIC AT THE SCENE OF AN ACCIDENT
- PROCEDURES FOR PIC INTERCEPTING A DISTRESS TRANSMISSION
- SEARCH AND RESCUE SIGNALS

**ANNEX 13, AIRCRAFT ACCIDENT INVESTIGATION**

- APPLICABILITY
- NOTIFICATION
- THE OBJECTIVES OF INVESTIGATION
- EXAMPLES OF SERIOUS INCIDENTS

**ANNEX 14, AERODROME**

- AERODROME REFERENCE CODES
- WIDTH OF RUNWAYS
- WIDTH OF TAXIWAYS
- AERODROME DATA
- DECLARED DISTANCES
- RADIO ALTIMETER OPERATING AREA
- TYPES OF WATER DEPOSIT ON THE RUNWAY
- THREE DEFINED STATES OF FROZEN WATER ON THE RUNWAY
- BRAKING ACTION
- RUNWAY STRIPS
- RUNWAY END SAFETY AREAS
- CLEARWAYS
- STOPWAYS
- TAXIWAY CURVES
- VISUAL AIDS FOR NAVIGATION
- INDICATORS AND SIGNALLING DEVICES

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>AIR LAW</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>5/10</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>ANNEX 15, AERONAUTICAL INFORMATION SERVICE</p> <ul style="list-style-type: none"> <li>➤ DEFINITIONS</li> <li>➤ GENERAL</li> <li>➤ AVAILABILITY OF INFORMATION</li> <li>➤ DUTIES OF AN AIS</li> <li>➤ WGS-84</li> <li>➤ AERONAUTICAL INFORMATION PUBLICATIONS (AIP)</li> <li>➤ STRUCTURE.</li> <li>➤ PART 1- GEN</li> <li>➤ PART2-ENR</li> <li>➤ PART 3-AD</li> <li>➤ PERMANENT CHANGES TO AIP</li> <li>➤ AIP SUPPLEMENTS</li> <li>➤ NOTAM</li> </ul>	

**LECTURE DETAILS**

SUBJECT TITLE:

**AIR LAW**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **6/10**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

ANNEX 17, SECURITY

- GENERAL
- AIMS AND OBJECTIVES OF AVIATION SECURITY
- SECURITY AND FACILITATION
- PREVENTATIVE SECURITY MEASURES
- MANAGEMENT OF RESPONSES TO ACTS OF UNLAWFUL INTERFERENCE
- OTHER GUIDANCE ON SECURITY
- ANNEX 2
- ANNEX 6

THE OTHER ANNEXES

- ANNEX 14
- PANS-RAC
- ANNEX 3 - METEOROLOGICAL SERVICES
- ANNEX 4 - AERONAUTICAL CHARTS
- ANNEX 5 - DIMENSIONAL UNITS
- ANNEX 6 - OPERATIONS OF AIRCRAFT
- AERODROME OPERATING MINIMA
- SINGLE-ENGINE AEROPLANE OPERATIONS
- LIGHTS TO BE DISPLAYED BY AIRCRAFT
- ANNEX 10-AERONAUTICAL TELECOMMUNICATIONS
- ANNEX 16 - ENVIRONMENTAL PROTECTION
- ANNEX 18 - TRANSPORT OF DANGEROUS GOODS

**LECTURE DETAILS**

SUBJECT TITLE:

**AIR LAW**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **7/10**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

OTHER INTERNATIONALLY AGREED PROCEDURE

- ICAO PROCEDURES FOR AIR NAVIGATION - AIRCRAFT OPERATIONS (PANS-OPS)
- THE AIRCRAFT OPERATIONS DOCUMENT
- DEFINITIONS AND ABBREVIATIONS
- ABBREVIATIONS
- DEPARTURE PROCEDURES

APPROACH PROCEDURES

- GENERAL CRITERIA
- OBSTACLE CLEARANCE
- FACTORS AFFECTING OPERATIONAL MINIMA
- FACTORS AFFECTING A PRECISION APPROACH
- FACTORS AFFECTING A NON-PRECISION APPROACH
- APPROACH PROCEDURE DESIGN
- ACCURACY OF FIXES

APPROACH SEGMENTS

- ARRIVAL
- INITIAL
- INTERMEDIATE
- FINAL APPROACH SEGMENT
- ILS CRITERIA
- MISSED APPROACH
- VISUAL MANOEUVRING IN THE VICINITY OF THE AERODROME
- AREA NAVIGATION (RNAV) APPROACH PROCEDURES BASED ON VOR/DME

**LECTURE DETAILS**

SUBJECT TITLE:

**AIR LAW**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **8/10**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

PANS-RAC

- RELATIONSHIP BETWEEN PANS-RAC AND SARPS
- DEFINITIONS
- GENERAL PROVISIONS
- SUBMISSION OF A FLIGHT PLAN
- CHANGE FROM IFR TO VFR FLIGHT
- CLEARANCES AND INFORMATION
- TRANSMISSION OF ADS REPORTS
- AIR TRAFFIC INCIDENT REPORT
- PROCEDURES IN REGARD TO AIRCRAFT EQUIPPED WITH ACAS
- AREA CONTROL SERVICE
- GENERAL PROVISIONS FOR THE SEPARATION OF CONTROLLED TRAFFIC
- VERTICAL SEPARATION
- VERTICAL SEPARATION MINIMUM
- MACH NUMBER TECHNIQUE
- REDUCTION IN SEPARATION MINIMA
- ATC CLEARANCES
- CLEARANCE TO MAINTAIN OWN SEPARATION WHILE MAINTAINING VMC
- INTERCEPTION OF CIVIL AIRCRAFT
- APPROACH CONTROL SERVICE
- AERODROME CONTROL SERVICE
- FUNCTIONS OF AERODROME CONTROL TOWERS



<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>AIR LAW</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>9/10</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>JAR - FCL 1</p> <ul style="list-style-type: none"> <li>➤ GENERAL REQUIREMENTS</li> <li>➤ THE PRIVATE PILOTS LICENSE (AEROPLANE) - PPL(A)</li> <li>➤ THE COMMERCIAL PILOT LICENSE (AEROPLANE) - CPL(A)</li> <li>➤ AIRLINE TRANSPORT PILOT LICENSE - ATPL(A)</li> <li>➤ CLASS AND TYPE RATINGS</li> <li>➤ INSTRUCTOR RATINGS</li> <li>➤ MEDICAL REQUIREMENTS</li> </ul>	

**LECTURE DETAILS**

SUBJECT TITLE:

**AIR LAW**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **10/10**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

DOC 7030, THE EUR SECTION

- RULES OF THE AIR, AIR TRAFFIC SERVICES AND SEARCH AND RESCUE
- COMMUNICATIONS
- METEOROLOGY
- ICAO AND JAA DEFINITIONS

**SUBJECT DETAILS**

<b>021</b>	<b>AIRCRAFT GENERAL KNOWLEDGE AIRFRAME, SYSTEMS, POWER PLANT</b>
INSTRUCTIONAL HOURS:	<b>70</b>
NUMBER OF LECTURES:	<b>14</b>
LECTURE DURATION (WITHOUT BREAK):	<b>5</b>
NUMBER OF PROGRESS TESTS (MINIMUM):	<b>3</b>
NUMBER OF SAMPLE EXAMS (MINIMUM):	<b>1</b>

**GENERAL CONTENTS**

- ✓ STRESS, FATIGUE AND AIRFRAME DESIGN
- ✓ HYDRAULICS
- ✓ FLYING CONTROLS
- ✓ LANDING GEAR
- ✓ AIR AND PRESSURIZATION
- ✓ FUEL SYSTEMS
- ✓ ICE AND RAIN PROTECTION
- ✓ BASIC ELECTRICAL THEORY
- ✓ DIRECT CURRENT ELECTRICS
- ✓ ALTERNATING ELECTRICITY
- ✓ RADIO THEORY
- ✓ INTERNAL COMBUSTION PRINCIPLES
- ✓ PISTON
- ✓ THE GAS TURBINE ENGINE
- ✓ PROPELLERS
- ✓ LOGIC CIRCUITS & COMPUTERS
- ✓ FIRE & SMOKE DETECTION AND SUPPRESSION
- ✓ BREATHING SYSTEMS



**TRAINING MANUAL  
PART 4  
Theoretical Knowledge  
Instruction**

Page: 42  
Revision: 1  
Date: 6 Feb 2009

**INTENTIONALLY LEFT BLANK**

**LECTURE DETAILS**

SUBJECT TITLE:		<b>AIRCRAFT GENERAL KNOWLEDGE AIRFRAME, SYSTEMS, POWER PLANT</b>	
DURATION:	5 HOURS	BREAK DURATION:	5 MINS
LECTURE NUMBER:	<b>1/14</b>	TOTAL BREAK DURATION:	15 MINS

**CONTENTS & OBJECTIVES**

STRESS, FATIGUE AND AIRFRAME DESIGN

- STRESS AND FATIGUE
- STRESS AND SYSTEM FAILURE
- THE S/N CURVE
- FATIGUE MONITORS
- REDUCING FATIGUE
- CERTIFICATION REQUIREMENTS
- MATERIALS.
- ALUMINIUM AND ALUMINIUM ALLOYS
- MAGNESIUM ALLOYS
- TITANIUM ALLOYS
- MONEL
- HONEYCOMB MATERIALS
- COMPOSITES
- AIRCRAFT CONFIGURATION
- THE FUSELAGE
- THE MONOCOQUE FUSELAGE
- THE SEMI-MONOCOQUE FUSELAGE
- THE REINFORCED SHELL FUSELAGE
- PRESSURISATION LOADS
- THE WINGS
- WING LOADS
- THE EMPENNAGE

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>AIRCRAFT GENERAL KNOWLEDGE AIRFRAME, SYSTEMS, POWER PLANT</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>2/14</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>HYDRAULICS</p> <ul style="list-style-type: none"> <li>➤ STATIC PRESSURE</li> <li>➤ PASCAL'S LAW</li> <li>➤ FORCE, AREA AND PRESSURE</li> <li>➤ THE PASSIVE HYDRAULIC SYSTEM</li> <li>➤ COMPONENTS OF AN ACTIVE (POWERED) HYDRAULIC SYSTEM</li> <li>➤ PUMPS</li> <li>➤ ACTUATORS</li> <li>➤ LINEAR ACTUATORS</li> <li>➤ SINGLE ACTING ACTUATORS</li> <li>➤ DOUBLE ACTING BALANCED ACTUATORS</li> <li>➤ DOUBLE ACTING UNBALANCED ACTUATORS</li> <li>➤ ROTARY ACTUATORS (HYDRAULIC MOTORS)</li> <li>➤ HYDRAULIC SEALS</li> <li>➤ LEAKS</li> <li>➤ SELECTOR VALVES</li> <li>➤ ROTARY SELECTORS</li> <li>➤ SPOOL VALVES</li> <li>➤ HYDRAULIC LOCK</li> <li>➤ THE OPEN CENTERED SYSTEM</li> <li>➤ VALVES</li> <li>➤ PRESSURE AND THERMAL RELIEF VALVE</li> <li>➤ NON RETURN VALVES (NRVS)</li> <li>➤ SHUTTLE VALVES</li> <li>➤ RESTRICTOR VALVES OR CHOKES</li> <li>➤ THROTTLING VALVES</li> <li>➤ FLOW CONTROL VALVES</li> <li>➤ PRESSURE REDUCING VALVES</li> <li>➤ SEQUENCE VALVES</li> </ul>	

**LECTURE DETAILS**

SUBJECT TITLE:		<b>AIRCRAFT GENERAL KNOWLEDGE AIRFRAME, SYSTEMS, POWER PLANT</b>	
DURATION:	5 HOURS	BREAK DURATION:	5 MINS
LECTURE NUMBER:	<b>3/14</b>	TOTAL BREAK DURATION:	15 MINS

**CONTENTS & OBJECTIVES**

HYDRAULICS

- HYDRAULIC FUSES
- PRIORITY VALVE OR PRESSURE MAINTAINING VALVE
- HYDRAULIC FLUIDS
- VEGETABLE BASED FLUID
- MINERAL BASED FLUID - DTD 585
- SYNTHETIC BASE - SKYDROL
- HEALTH AND HANDLING OF HYDRAULIC FLUIDS
- FLUID TEMPERATURE
- FILTRATION AND HYDRAULIC CIRCUIT PROTECTION
- FIXED VOLUME OR CONSTANT DISPLACEMENT PUMPS
- AUTOMATIC CUT-OUT VALVE
- ACCUMULATORS
- VARIABLE VOLUME OR CONSTANT PRESSURE PUMPS
- BLOCKING VALVE
- BACK UP HYDRAULIC POWER
- HYDRAULIC POWER TRANSFER
- AIR TURBINE MOTORS
- AC PUMPS
- RAM AIR TURBINE
- HAND PUMPS
- PRESSURE GAUGES
- DIRECT READING GAUGES
- PRESSURE TRANSMITTERS
- RESERVOIRS
- PRESSURISED RESERVOIR
- THE LIGHT AIRCRAFT POWER PACK
- LARGE AIRCRAFT SYSTEMS
- HYDRAULIC CONTROLS AND INDICATORS

**LECTURE DETAILS**

SUBJECT TITLE:		<b>AIRCRAFT GENERAL KNOWLEDGE AIRFRAME, SYSTEMS, POWER PLANT</b>	
DURATION:	5 HOURS	BREAK DURATION:	5 MINS
LECTURE NUMBER:	<b>4/14</b>	TOTAL BREAK DURATION:	15 MINS

**CONTENTS & OBJECTIVES**

FLYING CONTROLS

- PRIMARY FLIGHT CONTROLS
- POWER ASSISTED FLIGHT CONTROLS
- POWERED FLYING CONTROLS
- ARTIFICIAL FEEL
- GEAR CHANGE AND DATUM SHIFT
- THE PCU
- MECHANICAL CONTROL RUNS
- MANUAL CONTROL
- FEEL AND TRIM
- AUTOPILOT CONTROL
- SAFETY FEATURES
- FLY-BY-WIRE SYSTEMS
- SAFETY FEATURES
- SECONDARY FLIGHT CONTROL SYSTEMS
- LIGHT AIRCRAFT
- FLAPS AND SLATS
- TRIM
- LARGE AIRCRAFT
- FLAPS AND SLATS
- LOAD LIMITING DEVICES
- ALPHA / SPEED LOCKS
- SPEEDBRAKES AND SPOILERS
- TRIM

PROGRESS TEST

REVIEW OF PROGRESS TEST ANSWERS  
QUESTIONS & ANSWERS ON ALL TOPICS



**LECTURE DETAILS**

SUBJECT TITLE:		<b>AIRCRAFT GENERAL KNOWLEDGE AIRFRAME, SYSTEMS, POWER PLANT</b>	
DURATION:	5 HOURS	BREAK DURATION:	5 MINS
LECTURE NUMBER:	<b>5/14</b>	TOTAL BREAK DURATION:	15 MINS

**CONTENTS & OBJECTIVES**

LANDING GEAR

- FIXED UNDERCARRIAGES
- RETRACTABLE LANDING GEAR
- SHOCK ABSORPTION
- OLEO PNEUMATIC SHOCK ABSORBER STRUT
- OLEO PNEUMATIC SHOCK ABSORBER WITHOUT SEPARATOR
- OLEO PNEUMATIC SHOCK ABSORBER WITH SEPARATOR
- TORQUE LINK (SCISSOR LINK)
- GEAR SELECTOR
- RETRACTION AND EXTENSION SEQUENCE
- LANDING GEAR OPERATING SPEEDS
- EMERGENCY LOWERING
- STEERING
- LARGE AIRCRAFT. NOSE WHEEL STEERING
- WHEEL BRAKES
- ELECTRONIC ANTI - SKID
- TOUCHDOWN AND BOUNCE PROTECTION
- FAILURE INDICATIONS
- AUTOMATIC BRAKING
- REJECTED TAKE-OFF (RTO)
- TIRE CONSTRUCTION
- TUBE TIRES
- TUBELESS TIRES
- TIRE MARKINGS
- TREAD PATTERNS
- EMERGENCY BRAKES
- FIXED FIRE EXTINGUISHER BOTTLES
- EMERGENCY UNDERCARRIAGE BLOW DOWN

**LECTURE DETAILS**

SUBJECT TITLE:		<b>AIRCRAFT GENERAL KNOWLEDGE AIRFRAME, SYSTEMS, POWER PLANT</b>	
DURATION:	5 HOURS	BREAK DURATION:	5 MINS
LECTURE NUMBER:	<b>6/14</b>	TOTAL BREAK DURATION:	15 MINS

**CONTENTS & OBJECTIVES**

**AIR AND PRESSURIZATION**

- THE NEED FOR TEMPERATURE CONTROL
- THE NEED FOR PRESSURE REGULATION
- LIGHT AIRCRAFT HEATING SYSTEMS
- RAM AIR LIGHT AIRCRAFT SYSTEM
- RAM AIR COMBUSTION HEATER
- ADVANTAGES
- DISADVANTAGES
- TURBO CHARGED PISTON ENGINES
- DEDICATED DISPLACEMENT BLOWERS
- LARGE AIRCRAFT TEMPERATURE CONTROL
- AIR COOLING SYSTEMS
- BOOTSTRAP SYSTEMS
- FUNCTION AND OPERATION
- THE BOOTSTRAP
- WATER EXTRACTOR
- PLENUM
- BRAKE TURBINE SYSTEMS
- TURBO FAN SYSTEM
- VAPOR CYCLE COOLING
- SYSTEM PROTECTION
- CARGO COMPARTMENTS
- RECIRCULATION SYSTEMS
- PRESSURIZATION SYSTEMS
- DIFFERENTIAL PRESSURE
- SYSTEM OPERATION IN FLIGHT
- THE PRESSURE HULL AND SYSTEM COMPONENTS
- OUTFLOW/DISCHARGE VALVES
- SAFETY VALVES

**LECTURE DETAILS**

SUBJECT TITLE:		<b>AIRCRAFT GENERAL KNOWLEDGE AIRFRAME, SYSTEMS, POWER PLANT</b>	
DURATION:	5 HOURS	BREAK DURATION:	5 MINS
LECTURE NUMBER:	<b>7/14</b>	TOTAL BREAK DURATION:	15 MINS

**CONTENTS & OBJECTIVES**

FUEL SYSTEMS

- FUEL TANKS
- LIGHT AIRCRAFT SYSTEMS
- VAPOUR LOCKING
- VENTING
- FUEL FEED
- LARGE AIRCRAFT SYSTEMS
- LOW PRESSURE FUEL PUMPS
- THE LOW FUEL PRESSURE LIGHT
- NON-RETURN OR CHECK VALVES
- FUEL TANK VENTING
- VENT SURGE TANKS
- CROSSFEED VALVE
- FUEL HEATING
- FLIGHT DECK INDICATIONS
- THE CAPACITANCE SYSTEM
- MANUAL MEASURING SYSTEMS
- DRIP STICK
- MAGNETIC STICK
- FUEL FLOW GAUGING
- FUEL JETTISONING
- REFUELLING
- FUEL SAMPLING
- REFUELLING PRECAUTIONS
- FUEL TYPES
- AVIATION GASOLINE (AVGAS)
- GRADES
- MOGAS
- WIDE CUT FUELS
- GRADE LABELS

**LECTURE DETAILS**

SUBJECT TITLE:		<b>AIRCRAFT GENERAL KNOWLEDGE AIRFRAME, SYSTEMS, POWER PLANT</b>	
DURATION:	5 HOURS	BREAK DURATION:	5 MINS
LECTURE NUMBER:	<b>8/14</b>	TOTAL BREAK DURATION:	15 MINS

**CONTENTS & OBJECTIVES**

ICE AND RAIN PROTECTION

- JAR OPS REQUIREMENTS
- IN FLIGHT ICING CONDITIONS
- TYPES OF ICING
- FROST OR HOAR FROST
- RUNBACK ICING, +10 TO -3°C
- GLAZE OR CLEAR ICE, -3 TO -8°C
- RIME ICE, BELOW-8 °C
- ICE DETECTION
- VIBRATING ROD SYSTEMS
- PRESSURE OPERATED DETECTORS
- HOT ROD SYSTEMS
- SERRATED ROTOR SYSTEMS
- ICE DETECTION LIGHTS
- AIRFRAME ANTI-ICING AND DE-ICING
- DE-ICING PASTE
- THERMAL SYSTEMS
- PROPELLER ANTI-ICING AND DE-ICING
- ELECTRICAL PROPELLER DE-ICING
- LIGHT AIRCRAFT COCKPIT INDICATIONS
- TURBO-PROP COCKPIT INDICATIONS
- FLUID DE-ICING SYSTEM FOR PROPELLERS
- WINDSCREEN PROTECTION
- WINDSCREEN DE-ICING
- PITOT AND STATIC VENT HEATING

PROGRESS TEST

REVIEW OF PROGRESS TEST ANSWERS  
QUESTIONS & ANSWERS ON ALL TOPICS

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>AIRCRAFT GENERAL KNOWLEDGE AIRFRAME, SYSTEMS, POWER PLANT</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>9/14</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p><b>BASIC ELECTRICAL THEORY</b></p> <ul style="list-style-type: none"> <li>➤ ELECTRICAL CIRCUITS</li> <li>➤ RESISTORS</li> <li>➤ SERIES AND PARALLEL CIRCUITS</li> <li>➤ POWER</li> <li>➤ METERS</li> <li>➤ THE ELECTRIC FIELD</li> </ul> <p><b>DIRECT CURRENT ELECTRICS</b></p> <ul style="list-style-type: none"> <li>➤ BATTERIES</li> <li>➤ PRIMARY CELLS</li> <li>➤ SECONDARY CELLS</li> <li>➤ LEAD ACID BATTERIES</li> <li>➤ NICKEL CADMIUM (NICAD) BATTERIES</li> <li>➤ BATTERY CHECKING</li> <li>➤ CHARGING</li> <li>➤ BATTERY RATINGS &amp; CONNECTIONS</li> <li>➤ SINGLE POLE OR DIPOLE</li> <li>➤ DC POWER DISTRIBUTION</li> <li>➤ CIRCUIT AND COMPONENT PROTECTION</li> <li>➤ CIRCUIT BREAKERS</li> <li>➤ BI-METALLIC CIRCUIT BREAKERS</li> <li>➤ MAGNETIC CIRCUIT BREAKERS</li> <li>➤ FUSES</li> <li>➤ WARNING LIGHTS</li> <li>➤ SWITCHES</li> <li>➤ STATIC PROTECTION</li> <li>➤ SCREENING</li> </ul>	

**LECTURE DETAILS**

SUBJECT TITLE:		<b>AIRCRAFT GENERAL KNOWLEDGE AIRFRAME, SYSTEMS, POWER PLANT</b>	
DURATION:	5 HOURS	BREAK DURATION:	5 MINS
LECTURE NUMBER:	<b>10/14</b>	TOTAL BREAK DURATION:	15 MINS

**CONTENTS & OBJECTIVES**

ALTERNATING ELECTRICITY

- CALCULATING THE FREQUENCY
- THE SELF-EXCITED BRUSHLESS AC GENERATOR
- ADVANTAGES OF AC GENERATORS
- THE STAR CONNECTION
- CAPACITANCE, INDUCTANCE, IMPEDANCE AND REACTANCE
- CAPACITANCE AND CAPACITORS
- INDUCTORS AND INDUCTANCE
- CAPACITORS AND INDUCTORS IN A. CIRCUIT
- AC POWER
- GENERATOR POWER RATINGS
- AC FREQUENCY CONTROL
- FREQUENCY WILD ALTERNATORS
- RECTIFIERS
- ZENER DIODES
- TRANSISTORS
- AC POWER DISTRIBUTION
- SPLIT BUSBAR SYSTEM
- PARALLELED SYSTEMS
- PROTECTION AND GENERATOR CONTROL
- GENERATOR CONTROL UNIT (GCU)
- BUS TIE BREAKERS AND TRANSFER BUSBARS
- LOAD SHEDDING
- COCKPIT INDICATIONS AND CONTROLS
- CIRCUIT SYMBOLS

**LECTURE DETAILS**

SUBJECT TITLE:		<b>AIRCRAFT GENERAL KNOWLEDGE AIRFRAME, SYSTEMS, POWER PLANT</b>	
DURATION:	5 HOURS	BREAK DURATION:	5 MINS
LECTURE NUMBER:	<b>11/14</b>	TOTAL BREAK DURATION:	15 MINS

**CONTENTS & OBJECTIVES**

RADIO THEORY

- OSCILLATING CIRCUITS
- SERIES OSCILLATORS
- TANK CIRCUITS
- CRYSTAL CONTROLLED OSCILLATORS
- RESONANT CAVITIES
- PRODUCING A RADIO WAVE
- FREQUENCY AND WAVELENGTH
- THE FREQUENCY SPECTRUM

INTERNAL COMBUSTION PRINCIPLES

- THE PROPERTIES AND BEHAVIOR OF GASES
- BOYLE'S LAW
- CHARLES' LAW
- THE COMBINED GAS LAW
- CONSERVATION OF ENERGY
- BERNOULLI'S EQUATION
- GAS PROPERTIES
- MECHANISMS FOR HEAT TRANSFER
- NEWTON'S LAWS OF MOTION
- NEWTON'S 1 ST LAW
- NEWTON'S 2ND LAW
- NEWTON'S 3RD LAW
- DEFINITIONS
- THRUST
- POWER
- EFFICIENCY

**LECTURE DETAILS**

SUBJECT TITLE:		<b>AIRCRAFT GENERAL KNOWLEDGE AIRFRAME, SYSTEMS, POWER PLANT</b>	
DURATION:	5 HOURS	BREAK DURATION:	5 MINS
LECTURE NUMBER:	<b>12/14</b>	TOTAL BREAK DURATION:	15 MINS

**CONTENTS & OBJECTIVES**

**PISTON**

- THE SPARK IGNITION ENGINE
- PRINCIPLE OF OPERATION
- FUNCTION OF THE MAJOR COMPONENTS
- THE THEORETICAL FOUR-STROKE CYCLE
- THE COMPRESSION STROKE
- COMBUSTION
- THE POWER STROKE
- THE EXHAUST STROKE
- WORK ON THE AIR
- THE PRACTICAL FOUR STROKE CYCLE
- VALVE TIMING
- IGNITION TIMING
- MULTI CYLINDER ENGINES
- HORIZONTALLY OPPOSED ENGINE
- MAJOR COMPONENTS OF A SPARK IGNITION ENGINE
- CYLINDER AND CYLINDER HEAD
- SPARKPLUGS
- SPECIFIC FUEL CONSUMPTION
- ENGINE LUBRICATION SYSTEMS
- AERO ENGINE OILS

PROGRESS TEST  
REVIEW OF PROGRESS TEST ANSWERS  
QUESTIONS & ANSWERS ON ALL TOPICS



<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>AIRCRAFT GENERAL KNOWLEDGE AIRFRAME, SYSTEMS, POWER PLANT</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>13/14</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p><b>THE GAS TURBINE ENGINE</b></p> <ul style="list-style-type: none"> <li>➤ INTRODUCTION</li> <li>➤ CREATING JET THRUST</li> <li>➤ FACTORS AFFECTING THRUST</li> <li>➤ THE DRIVE FOR GREATER ENGINE EFFICIENCY</li> <li>➤ SPECIFIC FUEL CONSUMPTION</li> <li>➤ TYPES OF GAS TURBINE ENGINES</li> <li>➤ SINGLE SPOOL AXIAL FLOW TURBOJET</li> <li>➤ TWIN SPOOL BYPASS TURBOJET</li> <li>➤ THE TRIPLE-SPOOL HIGH BYPASS RATIO TURBO FAN</li> <li>➤ THE AIR INLET</li> </ul> <p><b>PROPELLERS</b></p> <ul style="list-style-type: none"> <li>➤ THE COMBINED AIRFLOW</li> <li>➤ THRUST AND TORQUE FORCES</li> <li>➤ THE TWISTED BLADE</li> <li>➤ THE EFFECT OF FORWARD SPEED</li> <li>➤ VARIABLE PITCH PROPELLERS</li> <li>➤ THE FULL RANGE OF PITCH</li> <li>➤ REVERSE THRUST</li> <li>➤ ATMAN DCTM</li> <li>➤ WINDMILLING</li> <li>➤ DOUBLE ACTING PCM</li> <li>➤ SINGLE ACTING PCM</li> <li>➤ TWIN-ENGINE AIRCRAFT</li> <li>➤ SINGLE-ENGINE AIRCRAFT</li> </ul>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>AIRCRAFT GENERAL KNOWLEDGE AIRFRAME, SYSTEMS, POWER PLANT</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>14/14</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>LOGIC CIRCUITS &amp; COMPUTERS</p> <ul style="list-style-type: none"> <li>➤ COUNTING DEVICES</li> <li>➤ BITS AND BYTES</li> <li>➤ OTHER NUMBER SYSTEMS</li> <li>➤ LOGIC GATES</li> <li>➤ INTEGRATED CIRCUITS</li> <li>➤ DIGITAL COMPUTERS</li> <li>➤ THE CPU</li> <li>➤ THE MEMORY</li> <li>➤ THE INPUT AND OUTPUT INTERFACES</li> <li>➤ ANALOGUE COMPUTERS</li> </ul> <p>FIRE &amp; SMOKE DETECTION AND SUPPRESSION</p> <ul style="list-style-type: none"> <li>➤ <b>AUTOMATIC SYSTEMS</b></li> <li>➤ SMOKE DETECTION</li> <li>➤ ION DETECTION SYSTEMS</li> <li>➤ OPTICAL SYSTEMS</li> <li>➤ FIRE DETECTION</li> </ul> <p>BREATHING SYSTEMS</p> <ul style="list-style-type: none"> <li>➤ SAFETY PRECAUTIONS</li> <li>➤ GASEOUS OXYGEN</li> <li>➤ CREW OXYGEN DELIVERY SYSTEMS</li> <li>➤ LIGHT AIRCRAFT CONTINUOUS FLOW SYSTEMS</li> <li>➤ LARGE AIRCRAFT DILUTER DEMAND REGULATORS</li> <li>➤ COMPONENTS AND OPERATION</li> </ul> <p>SAMPLE EXAM REVIEW OF SAMPLE TEST ANSWERS QUESTIONS &amp; ANSWERS ON ALL TOPICS</p>	

**SUBJECT DETAILS**

<b>022</b>	<b>AIRCRAFT GENERAL KNOWLEDGE INSTRUMENTS, ELECTRONICS</b>
INSTRUCTIONAL HOURS:	<b>70</b>
NUMBER OF LECTURES:	<b>14</b>
LECTURE DURATION (WITHOUT BREAK):	<b>5</b>
NUMBER OF PROGRESS TESTS (MINIMUM):	<b>3</b>
NUMBER OF SAMPLE EXAMS (MINIMUM):	<b>1</b>

**CONTENTS**

- PRINCIPLES AND SENSORS
- PRESSURE INSTRUMENTS
- GYROSCOPES
- MAGNETISM AND COMPASSES
- REMOTE INDICATING GYRO COMPASSES
- INERTIAL NAVIGATION
- FMS
- EFIS, EICAS AND ECAM
- AUTOFLIGHT
- WARNING AND RECORDING SYSTEMS
- POWERPLANT AND SYSTEM MONITORING



**TRAINING MANUAL  
PART 4  
Theoretical Knowledge  
Instruction**

Page: 58  
Revision: 1  
Date: 6 Feb 2009

**INTENTIONALLY LEFT BLANK**

**LECTURE DETAILS**

SUBJECT TITLE:		<b>AIRCRAFT GENERAL KNOWLEDGE INSTRUMENTS, ELECTRONICS</b>	
DURATION:	5 HOURS	BREAK DURATION:	5 MINS
LECTURE NUMBER:	<b>1/14</b>	TOTAL BREAK DURATION:	15 MINS

**CONTENTS & OBJECTIVES**

PRINCIPLES AND SENSORS

- INTRODUCTION
- THE PITOT STATIC SYSTEM
- PITOT STATIC ERRORS
- CONFIGURATION ERROR
- MANEUVER ERROR 4
- AIR TEMPERATURE MEASUREMENT
- THE TOTAL HEAD THERMOMETER
- TEMPERATURE MEASUREMENT ERRORS
- ANGLE OF ATTACK SENSORS
- VANE SENSORS
- PRESSURE SENSORS
- ACCELEROMETERS

QUESTIONS & ANSWERS ON ALL TOPICS

**LECTURE DETAILS**

SUBJECT TITLE:		<b>AIRCRAFT GENERAL KNOWLEDGE INSTRUMENTS, ELECTRONICS</b>	
DURATION:	5 HOURS	BREAK DURATION:	5 MINS
LECTURE NUMBER:	<b>2/14</b>	TOTAL BREAK DURATION:	15 MINS

**CONTENTS & OBJECTIVES**

PRESSURE INSTRUMENTS

- THE AIRSPEED INDICATOR
- INSTRUMENT DISPLAYS ERRORS
- TAS CALCULATIONS BLOCKAGES AND LEAKS
- CHECKS BEFORE FLIGHT
- THE ALTIMETER
- THE SIMPLE ALTIMETER ERRORS
- PRESSURE SETTINGS
- THE STANDARD SETTING
- SENSITIVE ALTIMETERS
- SERVO-ASSISTED ALTIMETERS
- INSTRUMENT DISPLAYS
- PRESSURE PROBLEMS
- TEMPERATURE PROBLEMS
- THE MACH METER
- THE LOCAL SPEED OF SOUND
- PRINCIPLE OF OPERATION ERRORS
- BLOCKAGES AND LEAKS
- COCKPIT INDICATIONS
- MACH/TEMP/TAS CALCULATIONS
- THE VSI ERRORS AND BLOCKAGES
- INSTRUMENT DISPLAYS
- SERVICEABILITY CHECKS
- AIR DATA COMPUTERS

QUESTIONS & ANSWERS ON ALL TOPICS

**LECTURE DETAILS**

SUBJECT TITLE:		<b>AIRCRAFT GENERAL KNOWLEDGE INSTRUMENTS, ELECTRONICS</b>	
DURATION:	5 HOURS	BREAK DURATION:	5 MINS
LECTURE NUMBER:	<b>3/14</b>	TOTAL BREAK DURATION:	15 MINS

**CONTENTS & OBJECTIVES**

GYROSCOPES

- CLASSIFICATION OF GYROSCOPES
- ALIGNMENT OF GYROSCOPES
- GYROSCOPIC WANDER
- REAL WANDER
- APPARENT WANDER
- TRANSPORT WANDER
- THE DIRECTION INDICATOR ERRORS
- EARTH'S ROTATION
- POINTS TO WATCH
- GIMBAL ERROR
- GYRO ERECTION
- ERECTION ERRORS
- ELECTRICALLY DRIVEN ARTIFICIAL HORIZONS
- PRINCIPLE OF OPERATION
- SERVO DRIVEN ATTITUDE INDICATORS
- RATE AND RATE INTEGRATING GYROS
- THE TURN AND SLIP INDICATOR
- PRINCIPLE OF OPERATION ERRORS
- CALCULATION OF RATE AND RADIUS OF TURN
- THE TURN CO-COORDINATOR
- THE RATE INTEGRATING GYRO
- LASER GYROS
- FREQUENCY LOCK
- REAL WANDER
- FIBER OPTIC GYROS

QUESTIONS & ANSWERS ON ALL TOPICS

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>AIRCRAFT GENERAL KNOWLEDGE INSTRUMENTS, ELECTRONICS</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>4/14</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>MAGNETISM AND COMPASSES</p> <ul style="list-style-type: none"> <li>➤ THE MOLECULAR THEORY OF MAGNETISM</li> <li>➤ MAGNETIC FIELDS</li> <li>➤ THE EARTH'S MAGNETISM</li> <li>➤ THE DIRECT READING COMPASS</li> <li>➤ PRINCIPLE OF OPERATION</li> <li>➤ THE E TYPE COMPASS ERRORS</li> <li>➤ ACCELERATION ERRORS</li> <li>➤ TURNING ERRORS</li> </ul> <p>PROGRESS TEST REVIEW OF PROGRESS TEST ANSWERS QUESTIONS &amp; ANSWERS ON ALL TOPICS</p>	



**LECTURE DETAILS**

SUBJECT TITLE:		<b>AIRCRAFT GENERAL KNOWLEDGE INSTRUMENTS, ELECTRONICS</b>	
DURATION:	5 HOURS	BREAK DURATION:	5 MINS
LECTURE NUMBER:	<b>5/14</b>	TOTAL BREAK DURATION:	15 MINS

**CONTENTS & OBJECTIVES**

REMOTE INDICATING GYRO COMPASSES

- THE DETECTOR UNIT
- MEASURING THE COMPONENT OF H IN EACH LEG
- THE SELWYN TRANSMISSION SYSTEM
- THE GYRO UNIT
- HEADING TRANSMISSION
- SYNCHRONIZATION
- USE AS A DIRECTIONAL GYRO
- SYSTEM ERRORS
- THE INERTIAL REFERENCE SYSTEM
- DEVIATION
- OTHER CAUSES OF DEVIATION
- CHANGES IN H
- CHANGES IN DEVIATING FORCES
- REASONS TO SWING THE COMPASS

QUESTIONS & ANSWERS ON ALL TOPICS

**LECTURE DETAILS**

SUBJECT TITLE:		<b>AIRCRAFT GENERAL KNOWLEDGE INSTRUMENTS, ELECTRONICS</b>	
DURATION:	5 HOURS	BREAK DURATION:	5 MINS
LECTURE NUMBER:	<b>6/14</b>	TOTAL BREAK DURATION:	15 MINS

**CONTENTS & OBJECTIVES**

**INERTIAL NAVIGATION**

- BASIC PRINCIPLES
- INERTIAL ACCELEROMETERS
- RATE INTEGRATING GYROS
- THE ACCELERATION AXES
- STABLE PLATFORMS AND STRAP DOWN SYSTEMS
- THE STABLE PLATFORM INS
- KEEPING THE PLATFORM LEVEL AND ALIGNED
- INITIAL ALIGNMENT AND LEVELING
- NAVIGATION ATTITUDE OUTPUTS
- CONTROLS AND INDICATORS
- THE MSU
- THE CONTROL DISPLAY UNIT
- SETTING UP
- INS NORMAL OPERATION
- THE WANDER ANGLE INS
- INITIAL ALIGNMENT AND LEVELING
- NAVIGATION
- CONTROLS AND INDICATORS SETTING UP
- FAST REALIGN MEN
- SYSTEM ERRORS
- EARTH RATE AND TRANSPORT WANDER
- CENTRIPETAL ACCELERATION
- POWER FAILURE
- NAVIGATION COMPUTER FAILURE

QUESTIONS & ANSWERS ON ALL TOPICS

**LECTURE DETAILS**

SUBJECT TITLE:		<b>AIRCRAFT GENERAL KNOWLEDGE INSTRUMENTS, ELECTRONICS</b>	
DURATION:	5 HOURS	BREAK DURATION:	5 MINS
LECTURE NUMBER:	<b>7/14</b>	TOTAL BREAK DURATION:	15 MINS

**CONTENTS & OBJECTIVES**

FMS

- LNAV AND VNAV
- COST MANAGEMENT WITH THE FMS
- FMS INPUTS
- THE CDU
- FMS SETUP IDENTIFICATION
- POSITION INITIALIZATION ROUTING
- PERFORMANCE INITIALIZATION
- TAKE-OFF REFERENCE IN FLIGHT
- NAVAID PRIORITY
- CALCULATED ETAS
- CHANGING THE ROUTING
- APPROACH AND LANDING
- SHUTDOWN
- OTHER FMS FUNCTIONS
- FMS OUTPUTS
- FMS OPERATING PHILOSOPHY
- MASTER/SLAVE OPERATION
- INDEPENDENT USE
- SINGLE USE BACK-UP

QUESTIONS & ANSWERS ON ALL TOPICS

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>AIRCRAFT GENERAL KNOWLEDGE INSTRUMENTS, ELECTRONICS</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>8/14</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>EFIS, EICAS AND ECAM</p> <ul style="list-style-type: none"> <li>➤ EFIS COMPONENTS</li> <li>➤ THE PFD</li> <li>➤ DECISION HEIGHT AND RADIO HEIGHT</li> <li>➤ PITCH LIMIT SYMBOLS</li> <li>➤ AUTOPILOT MODES</li> <li>➤ THE RISING RUNWAY</li> <li>➤ FLIGHT DIRECTORS</li> <li>➤ EFIS CONTROL PANEL</li> <li>➤ THE NAVIGATION DISPLAY</li> <li>➤ FULL ROSE DISPLAYS</li> <li>➤ EXPANDED ROSE DISPLAYS</li> <li>➤ PLAN MODE</li> <li>➤ SYMBOLS AND COLORS</li> <li>➤ REMOTE LIGHT SENSOR</li> <li>➤ EFIS FAILURE WARNINGS</li> <li>➤ ENGINE AND SYSTEM INFORMATION</li> <li>➤ EICAS</li> </ul> <p>PROGRESS TEST REVIEW OF PROGRESS TEST ANSWERS QUESTIONS &amp; ANSWERS ON ALL TOPICS</p>	

**LECTURE DETAILS**

SUBJECT TITLE:		<b>AIRCRAFT GENERAL KNOWLEDGE INSTRUMENTS, ELECTRONICS</b>	
DURATION:	5 HOURS	BREAK DURATION:	5 MINS
LECTURE NUMBER:	<b>9/14</b>	TOTAL BREAK DURATION:	15 MINS

**CONTENTS & OBJECTIVES**

AUTO FLIGHT

- THE AUTOPILOT
- AUTOPILOT CONTROL AND STABILITY
- CONTROL LAWS
- DIRECT CONTROL LAW
- PITCH RATE DEMAND/ATTITUDE HOLD LAW
- G DEMAND/FLIGHT PATH HOLD LAW
- SAFETY LIMITS
- AUTO TRIM
- COMPARISON
- AUTOPILOT MODES
- AUTOPILOT ENGAGE
- AUTOPILOT DISENGAGE
- VERTICAL SPEED CONTROL
- ALTITUDE CONTROL
- HEADING CONTROL
- VOR TRACKING
- SPEED CONTROL

QUESTIONS & ANSWERS ON ALL TOPICS

**LECTURE DETAILS**

SUBJECT TITLE:		<b>AIRCRAFT GENERAL KNOWLEDGE INSTRUMENTS, ELECTRONICS</b>	
DURATION:	5 HOURS	BREAK DURATION:	5 MINS
LECTURE NUMBER:	<b>10/14</b>	TOTAL BREAK DURATION:	15 MINS

**CONTENTS & OBJECTIVES**

AUTO FLIGHT

- AUTO THROTTLE
- AUTO THROTTLE TAKEOFF
- MODE ANNUNCIATION
- AUTO THROTTLE LIMITS
- ILS AND AUTO LAND
- ILS CAPTURE
- FAIL OPERATIONAL AND FAIL PASSIVE
- THE ALERT HEIGHT
- FULL AUTO LAND PROFILE
- AUTOMATIC APPROACHES WITHOUT AUTO-LAND
- GO-AROUND BACK COURSE
- FLIGHT DIRECTORS
- FD SYSTEM OPERATION
- FD AND AUTO THROTTLE TAKEOFF
- YAW DAMPING
- YAW DAMPING SYSTEMS
- FLY-BY-WIRE
- REDUNDANCY
- CONTROL LAWS
- PROS AND CONS

QUESTIONS & ANSWERS ON ALL TOPICS

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>AIRCRAFT GENERAL KNOWLEDGE INSTRUMENTS, ELECTRONICS</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>11/14</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>WARNING AND RECORDING SYSTEMS</p> <ul style="list-style-type: none"> <li>➤ ALERT LEVELS</li> <li>➤ WARNING TYPES</li> <li>➤ VISUAL WARNINGS</li> <li>➤ AURAL WARNINGS</li> <li>➤ TACTILE WARNINGS</li> <li>➤ COCKPIT EQUIPMENT</li> <li>➤ MASTER WARNINGS AND CAUTIONS</li> <li>➤ EICAS</li> <li>➤ AUTOMATIC SUPPRESSION OF WARNINGS AND CAUTIONS</li> <li>➤ FM RADIO ALTIMETERS</li> <li>➤ SYSTEM OPERATION</li> <li>➤ COCKPIT EQUIPMENT ACCURACY</li> <li>➤ GPWS &amp; TAS</li> <li>➤ INTRODUCTION</li> <li>➤ JAA REQUIREMENTS FOR GPWS</li> <li>➤ COCKPIT DISPLAYS</li> <li>➤ MODE 1</li> <li>➤ MODE 2</li> <li>➤ MODE3</li> <li>➤ MODE 4</li> <li>➤ MODE5</li> <li>➤ MODE 6</li> <li>➤ MODE 7</li> <li>➤ TAWS</li> <li>➤ INITIAL ACTIONS</li> <li>➤ CLASSIFICATION OF WARNINGS &amp; ALERTS</li> <li>➤ GENUINE</li> </ul>	

**LECTURE DETAILS**

SUBJECT TITLE:		<b>AIRCRAFT GENERAL KNOWLEDGE INSTRUMENTS, ELECTRONICS</b>	
DURATION:	5 HOURS	BREAK DURATION:	5 MINS
LECTURE NUMBER:	<b>12/14</b>	TOTAL BREAK DURATION:	15 MINS

**CONTENTS & OBJECTIVES**

WARNING AND RECORDING SYSTEMS

- NUISANCE
- FALSE
- STALL WARNING
- WARNINGS
- FLY-BY-WIRE
- SPEED STRIP MARKINGS
- SPEED WARNING
- TCAS
- INTRODUCTION
- PRINCIPLE OF OPERATION
- COCKPIT DISPLAYS
- REACTIONS
- TCAS INPUTS
- ALTITUDE ALERTING SYSTEM
- DATA RECORDERS
- THE AIRCRAFT INTEGRATED DATA SYSTEM
- THE DIGITAL FLIGHT DATA RECORDER
- JAR OPS REQUIREMENTS
- COCKPIT VOICE RECORDERS
- PRESERVATION AND USE OF RECORDINGS

PROGRESS TEST  
REVIEW OF PROGRESS TEST ANSWERS  
QUESTIONS & ANSWERS ON ALL TOPICS



**LECTURE DETAILS**

SUBJECT TITLE:		<b>AIRCRAFT GENERAL KNOWLEDGE INSTRUMENTS, ELECTRONICS</b>	
DURATION:	5 HOURS	BREAK DURATION:	5 MINS
LECTURE NUMBER:	<b>13/14</b>	TOTAL BREAK DURATION:	15 MINS

**CONTENTS & OBJECTIVES**

POWER PLANT AND SYSTEM MONITORING

- RPM MEASUREMENT
- THE MECHANICAL TACHOMETER
- THE TACHOGENERATOR
- DC TACHOGENERATOR
- THE SINGLE PHASE AC TACHOGENERATOR
- THE THREE PHASE AC TACHOGENERATOR
- THE INDUCTION TACHOMETER
- TURBINE DISPLAYS
- THE SYNCHROSCOPE TORQUE
- TEMPERATURE MEASUREMENT
- MODERATE TEMPERATURES
- HIGH TEMPERATURES
- VERY HIGH TEMPERATURES
- PRESSURE GAUGES DIAPHRAGMS
- CAPSULES AND BELLOWS
- MANIFOLD PRESSURE GAUGE BOURDON TUBES
- PRESSURE TRANSMITTERS
- VIBRATION SENSORS
- GAS TURBINE THRUST COMPUTATION
- GAS TURBINE ENGINE INSTRUMENTATION

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>AIRCRAFT GENERAL KNOWLEDGE INSTRUMENTS, ELECTRONICS</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>14/14</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>POWER PLANT AND SYSTEM MONITORING</p> <ul style="list-style-type: none"> <li>➤ FUEL-FLIGHT DECK INDICATIONS.</li> <li>➤ LP FUEL LIGHT</li> <li>➤ FUEL CONTENTS GAUGING</li> <li>➤ RESISTIVE SYSTEM</li> <li>➤ THE CAPACITANCE SYSTEM</li> <li>➤ MANUAL MEASURING SYSTEMS</li> <li>➤ DRIP STICK</li> <li>➤ MAGNETIC STICK</li> <li>➤ FUEL FLOW GAUGING</li> <li>➤ VENTURI FLOW INDICATORS</li> <li>➤ VARIABLE ORIFICE FLOW INDICATORS</li> <li>➤ TURBINE VOLUME FLOW INDICATORS</li> <li>➤ MASS FLOW INDICATORS</li> </ul> <p>SAMPLE EXAM REVIEW OF SAMPLE TEST ANSWERS QUESTIONS &amp; ANSWERS ON ALL TOPICS</p>	

<b>SUBJECT DETAILS</b>	
<b>031</b>	<b>BASS AND BALANCE</b>
INSTRUCTIONAL HOURS:	<b>40</b>
NUMBER OF LECTURES:	<b>8</b>
LECTURE DURATION (WITHOUT BREAK):	<b>5</b>
NUMBER OF PROGRESS TESTS (MINIMUM):	<b>2</b>
NUMBER OF SAMPLE EXAMS (MINIMUM):	<b>1</b>
<b>GENERAL DESCRIPTION &amp; OBJECTIVES OF SUBJECT TRAINING</b>	
<ul style="list-style-type: none"><li>✓ INTRODUCTION AND UNITS</li><li>✓ CENTRE OF GRAVITY</li><li>✓ MASS AND WEIGHT LIMITS</li><li>✓ COMPLETING THE LOAD SHEET</li><li>✓ THE LOADING MANUAL</li></ul>	



**TRAINING MANUAL  
PART 4  
Theoretical Knowledge  
Instruction**

Page: 74  
Revision: 1  
Date: 6 Feb 2009

**INTENTIONALLY LEFT BLANK**

**LECTURE DETAILS**

SUBJECT TITLE: **BASS AND BALANCE**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **1/8**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

INTRODUCTION AND UNITS

- THE LOADING MANUAL
- UNITS OF MASS AND DISTANCE
- IMPERIAL MEASUREMENTS
- METRIC MEASUREMENTS
- VOLUME
- SPECIFIC GRAVITY

**LECTURE DETAILS**

SUBJECT TITLE: **BASS AND BALANCE**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **2/8**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

**CENTRE OF GRAVITY**

- FORCES ACTING ON AN AIRCRAFT IN FLIGHT
- CENTRE OF GRAVITY POSITION
- THE EFFECT OF WEIGHT
- THE EFFECT OF GEAR AND FLAP POSITION
- MOMENTS
- THE DATUM
- FINDING THE CG POSITION
- ADDING MASS
- REMOVING MASS
- AN ALTERNATIVE METHOD
- SHIFTING THE LOAD
- BODY STATIONS
- LARGER PROBLEMS
- MEAN AERODYNAMIC CHORD-MAC
- CONVERTING POSITIONS FROM A DATUM TO %MAC

**LECTURE DETAILS**

SUBJECT TITLE: **BASS AND BALANCE**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **3/8**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

**MASS AND WEIGHT LIMITS**

- MASS AND WEIGHT DEFINITIONS
- BASIC EMPTY MASS
- VARIABLE LOAD
- DRY OPERATING MASS
- DISPOSABLE, USEFUL OR USEABLE LOAD
- THE TRAFFIC LOAD
- ZERO FUEL MASS
- OPERATING MASS
- TAXY MASS
- TAKE OFF MASS
- REGULATED TAKE OFF MASS
- LANDING MASS
- ALL UP MASS (AUM) OR ALL UP WEIGHT (AUW)
- MAXIMUM ALL UP MASS (MAUM)
- FINDING THE BASIC MASS AND DOM
- FLEET AVERAGES
- FLEET MASS CALCULATIONS
- AIRCRAFT WEIGHT CATEGORIES
- FINDING THE MASS OF THE VARIABLE LOAD

**LECTURE DETAILS**

SUBJECT TITLE: **BASS AND BALANCE**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **4/8**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

**MASS AND WEIGHT LIMITS**

- FLEET MASS CALCULATIONS
- AIRCRAFT WEIGHT CATEGORIES
- FINDING THE MASS OF THE VARIABLE LOAD
- FINDING THE MASS OF THE FUEL
- FINDING THE MASS OF THE TRAFFIC LOAD
- NINETEEN PASSENGER SEATS OR LESS
- TWENTY OR MORE PASSENGER SEATS
- THE OPERATOR'S RESPONSIBILITIES UNDER JARS



**LECTURE DETAILS**

SUBJECT TITLE:

**BASS AND BALANCE**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **5/8**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

MASS AND WEIGHT LIMITS

- AEROPLANE LOADING
- OPERATIONAL MARGINS WHEN FREE SEATING IS USED
- DOCUMENTATION
- FLOOR LOADING LIMITS
- DISTRIBUTION LOAD INTENSITY FLOOR RUNNING LOAD
- CALCULATING THE MAXIMUM PERMISSIBLE TRAFFIC LOAD AND MTOM
- IMIT AND ULTIMATE LOADS.

**LECTURE DETAILS**

SUBJECT TITLE:

**BASS AND BALANCE**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **6/8**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

COMPLETING THE LOAD SHEET

- THE REGULATIONS
- LOAD SHEET PRESENTATION
- LOAD SHEETS USING MANIFESTS AND GRAPHS

**LECTURE DETAILS**

SUBJECT TITLE:

**BASS AND BALANCE**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **7/8**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

THE LOADING MANUAL

- THE SINGLE ENGINE PISTON, SEP
- THE MULTI-ENGINE PISTON-MEP
- THE TWIN JET-MRJT
- BODY STATIONS AND MOMENT ARMS
- THE EFFECT OF GEAR AND FLAP RETRACTION
- GRAPH OF TRIM UNITS FOR CG POSITION
- MEAN AERODYNAMIC CHORD.
- STRUCTURAL MASS LIMITS
- FUEL.
- PASSENGERS AND CREW
- CARGO
- THE MANIFEST AND CG ENVELOPE
- THE LOAD & TRIM SHEET BALANCE

**LECTURE DETAILS**

SUBJECT TITLE:

**BASS AND BALANCE**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **8/8**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

THE LOADING MANUAL (REPETITION)

- THE SINGLE ENGINE PISTON, SEP
- THE MULTI-ENGINE PISTON-MEP
- THE TWIN JET-MRJT
- BODY STATIONS AND MOMENT ARMS
- THE EFFECT OF GEAR AND FLAP RETRACTION
- GRAPH OF TRIM UNITS FOR CG POSITION
- MEAN AERODYNAMIC CHORD.
- STRUCTURAL MASS LIMITS
- FUEL.
- PASSENGERS AND CREW
- CARGO
- THE MANIFEST AND CG ENVELOPE
- THE LOAD & TRIM SHEET BALANCE

<b>SUBJECT DETAILS</b>	
<b>032</b>	<b>PERFORMANCE</b>
INSTRUCTIONAL HOURS:	<b>60</b>
NUMBER OF LECTURES:	<b>12</b>
LECTURE DURATION (WITHOUT BREAK):	<b>5</b>
NUMBER OF PROGRESS TESTS (MINIMUM):	<b>3</b>
NUMBER OF SAMPLE EXAMS (MINIMUM):	<b>1</b>
<b>GENERAL DESCRIPTION &amp; OBJECTIVES OF SUBJECT TRAINING</b>	
<ul style="list-style-type: none"> <li>✓ CERTIFICATION &amp; STATISTICS</li> <li>✓ THE BASICS</li> <li>✓ THE TAKE-OFF</li> <li>✓ THE ENGINE FAILURE ON TAKE-OFF</li> <li>✓ THE CLIMB</li> <li>✓ THE CRUISE</li> <li>✓ DESCENT AND LANDING</li> <li>✓ OBSTACLE CLEARANCE</li> <li>✓ ADVANCED TAKE-OFF TECHNIQUES</li> <li>✓ JAR PERFORMANCE CLASS A AND B REGULATIONS</li> <li>✓ SEP</li> <li>✓ MEP</li> </ul>	



**TRAINING MANUAL  
PART 4  
Theoretical Knowledge  
Instruction**

Page: 84  
Revision: 1  
Date: 6 Feb 2009

**INTENTIONALLY LEFT BLANK**

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>PERFORMANCE</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>1/12</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>CERTIFICATION &amp; STATISTICS</p> <ul style="list-style-type: none"> <li>➤ AIRCRAFT CERTIFICATION</li> <li>➤ STATISTICS AND SAFETY MARGINS</li> <li>➤ PERFORMANCE CLASSES</li> <li>➤ CLASS A AIRCRAFT</li> <li>➤ CLASS B AIRCRAFT</li> <li>➤ CLASS C AIRCRAFT,</li> <li>➤ PERFORMANCE CAPABILITY AND MTOM</li> <li>➤ THE PERFORMANCE MANUAL</li> </ul>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>PERFORMANCE</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>2/12</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>THE BASICS</p> <ul style="list-style-type: none"> <li>➤ JET THRUST</li> <li>➤ PROPELLER THRUST</li> <li>➤ PROPELLER POWER</li> <li>➤ DRAG</li> <li>➤ TURNING</li> <li>➤ FUEL CONSUMPTION</li> <li>➤ THE RUNWAY DISTANCES AVAILABLE</li> <li>➤ RUNWAY SLOPE</li> <li>➤ DEFINITION</li> <li>➤ GENERAL DEFINITIONS</li> <li>➤ ENGINE DEFINITIONS</li> <li>➤ AIRSPEED DEFINITIONS</li> <li>➤ ALTITUDE AND TEMPERATURE DEFINITIONS</li> <li>➤ MASS DEFINITIONS</li> <li>➤ DECLARED RUNWAY DISTANCES</li> <li>➤ SPEEDS</li> </ul>	



**LECTURE DETAILS**

SUBJECT TITLE:

**PERFORMANCE**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **3/12**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

THE TAKE-OFF

- THE FORCES ACTING ON THE AIRCRAFT
- FACTORS AFFECTING TAKE-OFF DISTANCE
- AIRCRAFT MASS
- TEMPERATURE
- PRESSURE ALTITUDE

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>PERFORMANCE</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>4/12</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>THE ENGINE FAILURE ON TAKE-OFF</p> <ul style="list-style-type: none"> <li>➤ A RANGE OF DECISION SPEEDS</li> <li>➤ SAFETY FACTORS</li> <li>➤ WET RUNWAYS</li> <li>➤ LIMITS ON V1</li> <li>➤ THE ALL ENGINE CASE</li> <li>➤ THE EFFECT OF CLEARWAY</li> <li>➤ THE BALANCED FIELD VI</li> <li>➤ TORR CONSIDERATIONS</li> <li>➤ ASDR CONSIDERATIONS</li> </ul>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>PERFORMANCE</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>5/12</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>THE CLIMB</p> <ul style="list-style-type: none"> <li>➤ BEST ANGLE OF CLIMB</li> <li>➤ FACTORS THAT AFFECT CLIMB GRADIENT</li> <li>➤ FACTORS THAT AFFECT V<sub>X</sub></li> <li>➤ CLIMB GRADIENT CALCULATIONS</li> <li>➤ TAKE-OFF SAFETY SPEED, V<sub>2</sub></li> <li>➤ WAT OR CLIMB LIMITS</li> <li>➤ BEST RATE OF CLIMB</li> <li>➤ FACTORS THAT AFFECT RATE OF CLIMB</li> <li>➤ CALCULATIONS</li> <li>➤ FACTORS THAT AFFECT V<sub>Y</sub></li> <li>➤ WHICH SPEED TO USE?</li> <li>➤ ANGLE OF ATTACK IN THE CLIMB</li> <li>➤ FLIGHT PATH ANGLE AND PITCH ANGLE</li> <li>➤ NOISE ABATEMENT PROCEDURES</li> </ul>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>PERFORMANCE</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>6/12</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>THE CRUISE</p> <ul style="list-style-type: none"> <li>➤ CENTRE OF GRAVITY POSITION</li> <li>➤ JET AIRCRAFT</li> <li>➤ PROPELLER AIRCRAFT</li> <li>➤ FUEL FLOW CALCULATION</li> <li>➤ THE EFFECT OF WIND</li> <li>➤ LONG RANGE CRUISE</li> <li>➤ THE EFFECT OF WEIGHT AND HEIGHT</li> <li>➤ POWER AVAILABLE IN THE CRUISE</li> <li>➤ POWER REQUIRED IN THE CRUISE</li> <li>➤ LONG RANGE REQUIREMENTS AND ETOPS</li> <li>➤ THE BUFFET BOUNDARY LIMIT</li> <li>➤ RANGE/PA YLOAD DIAGRAMS</li> </ul>	

**LECTURE DETAILS**

SUBJECT TITLE:

**PERFORMANCE**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **7/12**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

DESCENT AND LANDING

- DESCENT
- APPROACH
- LANDING
- SCHEDULED LANDINGS

**LECTURE DETAILS**

SUBJECT TITLE:

**PERFORMANCE**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **8/12**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

OBSTACLE CLEARANCE

- TAKE-OFF
- EN-ROUTE
- LANDING

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>PERFORMANCE</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>9/12</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>ADVANCED TAKE-OFF TECHNIQUES</p> <ul style="list-style-type: none"> <li>➤ THE INCREASED V2 PROCEDURE</li> <li>➤ REDUCED THRUST TAKE-OFFS</li> <li>➤ CONTAMINATED RUNWAYS</li> <li>➤ THE CONFIGURATION DEVIATION LIST</li> <li>➤ PAVEMENT LOADING</li> </ul>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>PERFORMANCE</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>10/12</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>JAR PERFORMANCE CLASS A AND B REGULATIONS</p> <ul style="list-style-type: none"> <li>➤ GENERAL</li> <li>➤ TAKE-OFF.</li> <li>➤ OBSTACLE CLEARANCE ON TAKE-OFF</li> <li>➤ EN-ROUTE</li> <li>➤ LANDING</li> </ul>	



**LECTURE DETAILS**

SUBJECT TITLE:

**PERFORMANCE**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **11/12**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

SEP

- FINDING THE TAKE-OFF DISTANCE
- FINDING THE FIELD LENGTH LIMITED TOM
- FINDING THE CLIMB GRADIENT AND RATE OF CLIMB
- FINDING THE AIRCRAFT CEILING
- FINDING THE LANDING DISTANCE REQUIRED
- FINDING THE FIELD LENGTH LIMITED LANDING WEIGHT

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>PERFORMANCE</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>12/12</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>MEP</p> <ul style="list-style-type: none"> <li>➤ TAKE-OFF FIELD LENGTH</li> <li>➤ TAKE-OFF CLIMB</li> <li>➤ WAT/CLIMB LIMITS</li> <li>➤ OBSTACLE CLEARANCE, FLAPS UP TAKE-OFF</li> <li>➤ OBSTACLE CLEARANCE, SHORT FIELD TAKE-OFF</li> <li>➤ LANDING</li> <li>➤ LANDING CLIMB</li> <li>➤ LANDING FIELD LENGTH</li> </ul>	

<b>SUBJECT DETAILS</b>	
<b>033</b>	<b>FLIGHT PLANNING AND MONITORING</b>
INSTRUCTIONAL HOURS:	<b>60</b>
NUMBER OF LECTURES:	<b>12</b>
LECTURE DURATION (WITHOUT BREAK):	<b>5</b>
NUMBER OF PROGRESS TESTS (MINIMUM):	<b>3</b>
NUMBER OF SAMPLE EXAMS (MINIMUM):	<b>1</b>
<b>GENERAL DESCRIPTION &amp; OBJECTIVES OF SUBJECT TRAINING</b>	
<ul style="list-style-type: none"> <li>✓ FLIGHT PLANS FOR CROSS-COUNTRY FLIGHTS</li> <li>✓ ICAO ATC FLIGHT PLAN</li> <li>✓ PRACTICAL FLIGHT PLANNING</li> <li>✓ IFR (AIRWAYS) FLIGHT PLANNING</li> <li>✓ JET AEROPLANES FLIGHT PLANNING (ADDITIONAL CONSIDERATIONS)</li> <li>✓ PRACTICAL COMPLETION OF A 'FLIGHT PLAN'</li> </ul>	



**TRAINING MANUAL  
PART 4  
Theoretical Knowledge  
Instruction**

Page: 98  
Revision: 1  
Date: 6 Feb 2009

**INTENTIONALLY LEFT BLANK**

**LECTURE DETAILS**

SUBJECT TITLE: **FLIGHT PLANNING AND MONITORING**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **1/12**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

FLIGHT PLANS FOR CROSS-COUNTRY FLIGHTS

- NAVIGATION PLAN
- SELECTION OF ROUTES, SPEEDS, HEIGHTS (ALTITUDES) AND ALTERNATE AIRFIELD
- TERRAIN AND OBSTACLE CLEARANCE
- CRUISING LEVELS APPROPRIATE FOR DIRECTION OF FLIGHT
- NAVIGATION CHECK POINTS, VISUAL OR RADIO
- MEASUREMENT OF TRACKS AND DISTANCES
- OBTAINING WIND VELOCITY FORECAST FOR EACH LEG
- COMPUTATIONS OF HEADINGS, GROUND SPEEDS, AND TIME EN ROUTE FROM TRACKS, TRUE AIRSPEED AND WIND VELOCITIES
- COMPLETION OF PRE-FLIGHT PORTION OF NAVIGATION FLIGHT LOG
- FUEL PLAN

**LECTURE DETAILS**

SUBJECT TITLE: **FLIGHT PLANNING AND MONITORING**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **2/12**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

FLIGHT PLANS FOR CROSS-COUNTRY FLIGHTS

- COMPUTATION OF PLANNED FUEL USAGE FOR EACH LEG AND TOTAL FUEL USAGE FOR THE FLIGHT
- FLIGHT MANUAL FIGURES FOR FUEL FLOW DURING CLIMB, EN ROUTE AND DURING DESCENT
- NAVIGATION PLAN FOR TIMES EN ROUTE
- FUEL FOR HOLDING OR DIVERSION TO ALTERNATE AIRFIELD
- RESERVES
- TOTAL FUEL REQUIREMENTS FOR FLIGHT
- COMPLETION OF PRE-FLIGHT PORTION OF FUEL LOG
- FLIGHT MONITORING AND IN FLIGHT REPLANING
- IN FLIGHT FUEL COMPUTATIONS
- RECORDING OF FUEL QUANTITIES REMAINING AT NAVIGATIONAL CHECKPOINTS
- CALCULATION OF ACTUAL CONSUMPTION RATE
- COMPARISON OF ACTUAL CONSUMPTION AND FUEL STATE
- REVISION OF FUEL RESERVE ESTIMATES

**LECTURE DETAILS**

SUBJECT TITLE: **FLIGHT PLANNING AND MONITORING**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **3/12**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

FLIGHT PLANS FOR CROSS-COUNTRY FLIGHTS

- IN FLIGHT REPLANING IN CASE OF PROBLEMS
- SELECTION OF CRUISE ALTITUDE AND POWER SETTINGS FOR NEW DESTINATION
- TIME TO NEW DESTINATION
- FUEL STATE, FUEL REQUIREMENTS, FUEL RESERVES
- RADIO COMMUNICATION AND NAVIGATION AIDS
- COMMUNICATION FREQUENCIES AND CALL SIGNS FOR APPROPRIATE CONTROL AGENCIES AND IN-FLIGHT SERVICE FACILITIES SUCH AS WEATHER STATIONS
- RADIO NAVIGATION AND APPROACH AIDS, IF APPROPRIATE
- TYPE
- FREQUENCIES
- IDENTIFICATION

**LECTURE DETAILS**

SUBJECT TITLE: **FLIGHT PLANNING AND MONITORING**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **4/12**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

ICAO ATC FLIGHT PLAN

- TYPES OF FLIGHT PLAN
- ICAO FLIGHT PLAN
- FORMAT
- INFORMATION INCLUDED IN COMPLETED PLAN
- REPETITIVE FLIGHT PLAN
- COMPLETING THE FLIGHT PLAN
- INFORMATION FOR FLIGHT PLAN OBTAINED FROM
- NAVIGATION FLIGHT PLAN
- FUEL PLAN
- OPERATORS RECORDS FOR BASIC AIRCRAFT INFORMATION
- MASS AND BALANCE RECORDS
- FILING THE FLIGHT PLAN
- PROCEDURES FOR FILING
- AGENCY RESPONSIBLE FOR PROCESSING THE FLIGHT PLAN
- REQUIREMENTS OF THE STATE CONCERNING WHEN A FLIGHT PLAN MUST BE FILED
- CLOSING THE FLIGHT PLAN



<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>FLIGHT PLANNING AND MONITORING</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>5/12</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>ICAO ATC FLIGHT PLAN</p> <ul style="list-style-type: none"> <li>➤ RESPONSIBILITIES AND PROCEDURES</li> <li>➤ PROCESSING AGENCY</li> <li>➤ CHECKING SLOT TIME</li> <li>➤ ADHERENCE TO FLIGHT PLAN</li> <li>➤ TOLERANCES ALLOWED BY THE STATE FOR VARIOUS TYPES OF FLIGHT PLANS</li> <li>➤ IN FLIGHT AMENDMENT OF FLIGHT PLAN</li> <li>➤ CONDITIONS UNDER WHICH A FLIGHT PLAN MUST BE AMENDED</li> <li>➤ PILOT'S RESPONSIBILITIES AND PROCEDURES FOR FILING AN AMENDMENT</li> <li>➤ AGENCY TO WHICH AMENDMENTS ARE SUBMITTED</li> </ul>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>FLIGHT PLANNING AND MONITORING</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>6/12</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PRACTICAL FLIGHT PLANNING</p> <ul style="list-style-type: none"> <li>➤ CHART PREPARATION</li> <li>➤ PLOT TRACKS AND MEASURE DIRECTIONS AND DISTANCES</li> <li>➤ NAVIGATION PLANS</li> <li>➤ COMPLETING THE NAVIGATION PLAN USING</li> <li>➤ TRACKS AND DISTANCES FROM PREPARED CHARTS</li> <li>➤ WIND VELOCITIES AS PROVIDED</li> </ul>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>FLIGHT PLANNING AND MONITORING</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>7/12</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PRACTICAL FLIGHT PLANNING</p> <ul style="list-style-type: none"> <li>➤ TRUE AIRSPEEDS AS APPROPRIATE</li> <li>➤ SIMPLE FLIGHT PLANS</li> <li>➤ PREPARATION OF FUEL LOGS SHOWING PLANNED VALUES FOR</li> <li>➤ FUEL USED ON EACH LEG</li> <li>➤ FUEL REMAINING AT END OF EACH LEG</li> <li>➤ ENDURANCE, BASED ON FUEL REMAINING AND PLANNED CONSUMPTION RATE, AT END OF EACH LEG</li> </ul>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>FLIGHT PLANNING AND MONITORING</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>8/12</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>RADIO PLANNING PRACTICE</p> <ul style="list-style-type: none"> <li>➤ COMMUNICATIONS</li> <li>➤ FREQUENCIES AND CALL SIGNS OF AIR TRAFFIC CONTROL AGENCIES AND FACILITIES AND FOR IN FLIGHT SERVICES SUCH AS WEATHER INFORMATION</li> <li>➤ NAVIGATION AIDS</li> <li>➤ FREQUENCIES AND IDENTIFIERS OF EN ROUTE TERMINAL FACILITIES, IF APPROPRIATE</li> <li>➤ IFR (AIRWAYS) FLIGHT PLANING</li> <li>➤ METEOROLOGICAL CONSIDERATIONS</li> <li>➤ ANALYSIS OF EXISTING WEATHER PATTERNS ALONG POSSIBLE ROUTES</li> </ul>	

**LECTURE DETAILS**

SUBJECT TITLE: **FLIGHT PLANNING AND MONITORING**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **9/12**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

RADIO PLANNING PRACTICE

- ANALYSIS OF WINDS ALOFT ALONG PROSPECTIVE ROUTES
- ANALYSIS OF EXISTING AND FORECAST WEATHER CONDITIONS AT DESTINATION AND POSSIBLE ALTERNATES
- SELECTION OF ROUTES TO DESTINATION AND ALTERNATES
- PREFERRED AIRWAYS ROUTINGS
- EXTRACTION OF TRACKS AND DISTANCES FROM RAD/NAV CHART
- FREQUENCIES AND IDENTIFIERS OF EN ROUTE RADIO NAVIGATION AIDS
- MINIMUM ENROUTE ALTITUDES, MINIMUM CROSSING AND RECEPTION ALTITUDES
- STANDARD INSTRUMENT DEPARTURES (SID'S) AND STANDARD ARRIVAL ROUTES

**LECTURE DETAILS**

SUBJECT TITLE:

**FLIGHT PLANNING AND MONITORING**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **10/12**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

GENERAL FLIGHT PLANNING TASKS

- CHECKING OF AIP AND NOTAM FOR LATEST AIRFIELD AND EN ROUTE STATUS INFORMATION
- SELECTION OF ALTITUDES OF FLIGHT LEVELS FOR EACH LEG OF THE FLIGHT
- APPLICATION OF WIND VELOCITY ON EACH LEG TO OBTAIN HEADING AND GROUND SPEEDS
- CALCULATION OF EN ROUTE TIMES FOR EACH LEG TO THE DESTINATION AND TO THE ALTERNATE AND DETERMINATION OF TOTAL TIME EN ROUTE
- COMPLETION OF FUEL PLAN
- PRELIMINARY STUDY OF INSTRUMENT APPROACH PROCEDURES AND MINIMA AT DESTINATION AND ALTERNATE
- FILLING OUT AND FILING AIR TRAFFIC FLIGHT PLAN

**LECTURE DETAILS**

SUBJECT TITLE: **FLIGHT PLANNING AND MONITORING**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **11/12**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

JET AEROPLANES FLIGHT PLANING (ADDITIONAL CONSIDERATIONS)

- ADDITIONAL FLIGHT PLANNING ASPECTS FOR JET AEROPLANES (ADVANCED FLIGHT PLANNING)
- FUEL PLANNING
- EN-ROUTE CONTINGENCY FUEL
- DESTINATION, HOLDING AND DIVERSION FUEL
- ISLAND RESERVES
- IMPORTANCE OF ALTITUDE SELECTION WHEN PLANNING FOR DIVERSION TO ALTERNATE
- USE OF PERFORMANCE CHART TO PLAN FUEL USAGE AND REQUIREMENTS BASED ON PLANNED CLIMB, EN-ROUTE CRUISE AND DESCENT
- RESERVE FUEL REQUIREMENTS
- INFLUENCE OF CENTER OF GRAVITY ON FUEL CONSUMPTION
- COMPUTATION OF CRITICAL POINT (CP), POINT OF EQUAL TIME, POINT OF NO RETURN (PET) AND POINT OF SAFE RETURN (PSR)
- COMPUTERIZED FLIGHT PLANNING
- GENERAL PRINCIPLES OF PRESENT SYSTEMS
- ADVANTAGES
- SHORTCOMINGS AND LIMITATIONS
- PRACTICAL COMPLETION OF A 'FLIGHT PLAN'
- (FLIGHT PLAN, FLIGHT LOG, NAV LOG, ATC PLAN ECT.)

**LECTURE DETAILS**

SUBJECT TITLE: **FLIGHT PLANNING AND MONITORING**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **12/12**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

JET AEROPLANES FLIGHT PLANING (ADDITIONAL CONSIDERATIONS)

- EXTRACTION OF DATA
- EXTRACTION OF NAVIGATIONAL DATA
- EXTRACTION OF METEOROLOGICAL DATA
- EXTRACTION OF PERFORMANCE DATA
- COMPLETION OF NAVIGATION FLIGHT PLAN
- COMPLETION OF FUEL PLAN
- TIME AND FUEL TO TOP-OF-CLIMB
- CRUISE SECTOR TIMES AND FUEL USED
- TOTAL TIME AND FUEL REQUIRED TO DESTINATION
- FUEL REQUIRED FOR MISSED APPROACH, CLIMB EN -ROUTE ALTITUDE, AND CRUISE ALTERNATE
- RESERVE FUEL
- COMPUTATION OF CP (CRITICAL POINT), INCLUDING EQUI TIME AND EQUI FUEL POINTS, AND PET (POINT OF EQUAL TIME), AND PNR (POINT OF NO RETURN), AND PSR (POINT OF SAFE RETURN)
- COMPLETION OF AIR TRAFFIC FLIGHT PLAN



<b>SUBJECT DETAILS</b>	
<b>040</b>	<b>HUMAN PERFORMANCE AND LIMITATIONS</b>
INSTRUCTIONAL HOURS:	<b>60</b>
NUMBER OF LECTURES:	<b>12</b>
LECTURE DURATION (WITHOUT BREAK):	<b>5</b>
NUMBER OF PROGRESS TESTS (MINIMUM):	<b>3</b>
NUMBER OF SAMPLE EXAMS (MINIMUM):	<b>1</b>
<b>GENERAL DESCRIPTION &amp; OBJECTIVES OF SUBJECT TRAINING</b>	
<ul style="list-style-type: none"> <li>✓ BASIC CONCEPTS</li> <li>✓ RESPIRATION AND CIRCULATION</li> <li>✓ THE HAZARDS OF HIGH ALTITUDE OPERATION</li> <li>✓ THE NERVOUS AND SENSORY SYSTEMS</li> <li>✓ INTEGRATING THE SENSORY INPUTS</li> <li>✓ HEALTH IN AVIATION</li> <li>✓ SLEEP</li> <li>✓ INFORMATION PROCESSING</li> <li>✓ HUMAN ERROR AND RELIABILITY</li> </ul>	



**TRAINING MANUAL  
PART 4  
Theoretical Knowledge  
Instruction**

Page: 112  
Revision: 1  
Date: 6 Feb 2009

**INTENTIONALLY LEFT BLANK**

**LECTURE DETAILS**

SUBJECT TITLE: **HUMAN PERFORMANCE AND LIMITATIONS**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **1/12**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

**BASIC CONCEPTS**

- INTRODUCTION
- PILOT ERROR IN ACCIDENTS
- THE SHELL MODEL
- LIVEWARE / LIVEWARE
- LIVEWARE / SOFTWARE
- LIVEWARE / HARDWARE
- ENVIRONMENT / LIVEWARE
- LIVEWARE

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>HUMAN PERFORMANCE AND LIMITATIONS</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>2/12</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>RESPIRATION AND CIRCULATION</p> <ul style="list-style-type: none"> <li>➤ THE GAS LAWS</li> <li>➤ BOYLE'S LAW/</li> <li>➤ CHARLES' LAW</li> <li>➤ DALTON'S LAW</li> <li>➤ HENRY'S LAW</li> <li>➤ PICK'S LAW</li> <li>➤ HOW WE BREATHE</li> <li>➤ LUNG VOLUME</li> <li>➤ GAS TRANSFER</li> <li>➤ THE CIRCULATORY SYSTEM</li> <li>➤ THE COMPOSITION OF BLOOD</li> <li>➤ HYPOXIA</li> <li>➤ HYPERVENTILATION</li> <li>➤ DECOMPRESSION SICKNESS</li> <li>➤ IMMEDIATE ACTIONS ON LOSS OF PRESSURIZATION</li> <li>➤ THE EFFECTS OF ACCELERATION</li> </ul>	

**LECTURE DETAILS**

SUBJECT TITLE: **HUMAN PERFORMANCE AND LIMITATIONS**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **3/12**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

THE HAZARDS OF HIGH ALTITUDE OPERATION

- OZONE
- RADIATION
- BLUE AND UV LIGHT
- LOW HUMIDITY
- VERY LOW TEMPERATURES
- PROGRESS TEST
- REVIEW OF PROGRESS TEST ANSWERS
- QUESTIONS & ANSWERS ON ALL TOPICS

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>HUMAN PERFORMANCE AND LIMITATIONS</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>4/12</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>THE NERVOUS AND SENSORY SYSTEMS</p> <ul style="list-style-type: none"> <li>➤ THE EYE</li> <li>➤ ACCOMMODATION</li> <li>➤ RODS AND CONES</li> <li>➤ VISUAL ACUITY3</li> <li>➤ THE VISUAL FIELD</li> <li>➤ DEPTH PERCEPTION</li> <li>➤ COLOR VISION</li> <li>➤ NIGHT VISION</li> <li>➤ THE EAR</li> <li>➤ HEARING</li> <li>➤ BALANCE</li> <li>➤ SENSORY THRESHOLDS</li> <li>➤ THE NERVOUS AND ENDOCRINE SYSTEMS</li> <li>➤ THE CENTRAL NERVOUS SYSTEM</li> <li>➤ THE PERIPHERAL NERVOUS SYSTEM</li> <li>➤ THE ENDOCRINE SYSTEM</li> <li>➤ BODY TEMPERATURE CONTROL</li> </ul>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>HUMAN PERFORMANCE AND LIMITATIONS</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>5/12</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>INTEGRATING THE SENSORY INPUTS</p> <ul style="list-style-type: none"> <li>➤ VISUAL, ILLUSIONS</li> <li>➤ VISUAL CUES AND ILLUSIONS ON LANDING</li> <li>➤ VISUAL SEARCH AND MID-AIR COLLISIONS</li> <li>➤ SPATIAL ORIENTATION</li> <li>➤ MOTION SICKNESS</li> <li>➤ VERTIGO</li> <li>➤ VIBRATION</li> </ul>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>HUMAN PERFORMANCE AND LIMITATIONS</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>6/12</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>HEALTH IN AVIATION</p> <ul style="list-style-type: none"> <li>➤ COMMON MINOR AILMENTS</li> <li>➤ COLDS AND FLU</li> <li>➤ TEETH</li> <li>➤ STOMACH AND GUT</li> <li>➤ VISUAL DEFECTS</li> <li>➤ MYOPIA AND HYPERMETROPTI</li> <li>➤ PRESBYOPIA</li> <li>➤ ASTIGMATISM</li> <li>➤ GLAUCOMA AND CATARACTS</li> <li>➤ FLASH BLINDNESS</li> <li>➤ BLOOD PRESSURE</li> <li>➤ CORONARY DISEASE</li> <li>➤ OBESITY</li> </ul>	



<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>HUMAN PERFORMANCE AND LIMITATIONS</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>7/12</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>HEALTH IN AVIATION</p> <ul style="list-style-type: none"> <li>➤ DIET</li> <li>➤ TROPICAL AND EPIDEMIC DISEASES</li> <li>➤ MALARIA</li> <li>➤ YELLOW FEVER, POLIO AND TYPHOID</li> <li>➤ HEPATITIS</li> <li>➤ CHOLERA</li> <li>➤ TETANUS</li> <li>➤ SEXUALLY TRANSMITTED DISEASES</li> <li>➤ CIGARETTES, COFFEE, DRUGS AND ALCOHOL</li> <li>➤ CIGARETTES</li> <li>➤ COFFEE AND CAFFEINE</li> <li>➤ ALCOHOL</li> <li>➤ THE LAW AND ASSOCIATED GUIDELINES</li> <li>➤ DRUGS</li> <li>➤ ANAESTHETIC</li> <li>➤ TOXIC SUBSTANCES AND DANGEROUS GOODS</li> <li>➤ INCAPACITATION IN FLIGHT</li> </ul>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>HUMAN PERFORMANCE AND LIMITATIONS</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>8/12</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>SLEEP</p> <ul style="list-style-type: none"> <li>➤ INTRODUCTION</li> <li>➤ SLEEP CREDITS</li> <li>➤ THE NATURE OF SLEEP</li> <li>➤ THE CYCLES OF SLEEP</li> <li>➤ THE REQUIRED AMOUNT OF SLEEP</li> <li>➤ JET LAG.</li> <li>➤ SLEEP HYGIENE</li> <li>➤ SLEEP DISORDER</li> <li>➤ PROGRESS TEST</li> <li>➤ REVIEW OF PROGRESS TEST ANSWERS</li> <li>➤ QUESTIONS &amp; ANSWERS ON ALL TOPICS</li> </ul>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>HUMAN PERFORMANCE AND LIMITATIONS</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>9/12</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>INFORMATION PROCESSING</p> <ul style="list-style-type: none"> <li>➤ THE INFORMATION PROCESSING SYSTEM</li> <li>➤ VIGILANCE</li> <li>➤ OVER-AROUSAL AND UNDER-AROUSAL</li> <li>➤ ATTENTION</li> <li>➤ COPING WITH MANY TASKS</li> <li>➤ PERCEPTION</li> <li>➤ THE PROCESS OF PERCEPTION</li> <li>➤ VISUAL CONSTANCY</li> <li>➤ VISUAL CUES</li> <li>➤ PERCEPTUAL SET OR EXPECTANCY</li> <li>➤ MEMORY</li> <li>➤ THE STRUCTURE OF MEMORY THE SENSORY</li> <li>➤ WORKING MEMORY</li> <li>➤ LONG TERM MEMORY</li> <li>➤ LEARNING</li> </ul>	

**LECTURE DETAILS**

SUBJECT TITLE: **HUMAN PERFORMANCE AND LIMITATIONS**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **10/12**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

INFORMATION PROCESSING

- LEARNING
- DEFINITION OF LEARNING AND TYPES OF LEARNING
- CLASSICAL CONDITIONING
- OPERANT CONDITIONING
- LEARNING BY INSIGHT/LEARNING BY IMITATION
- FACTORS WHICH AFFECT LEARNING
- THE RELATIONSHIP BETWEEN MOTIVATION AND PERFORMANCE
- ACQUIRING SKILLS
- THE PHASES OF LEARNING A SKILL
- COGNITIVE PHASE
- ASSOCIATIVE STAGE
- AUTONOMOUS/AUTOMATIC STAGE
- MOTOR PROGRAMMES/MENTAL SCHEMA
- ADVANTAGES AND DISADVANTAGES OF MOTOR PROGRAMMES
- KNOWLEDGE-BASED BEHAVIOURS
- THE RISKS OF SKILL-BASED, RULE-BASED AND KNOWLEDGE-BASED BEHAVIOR

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>HUMAN PERFORMANCE AND LIMITATIONS</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>11/12</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>HUMAN ERROR AND RELIABILITY</p> <ul style="list-style-type: none"> <li>➤ THE UNRELIABILITY OF HUMAN BEHAVIOR</li> <li>➤ THE THEORY AND MODEL OF HUMAN ERROR</li> <li>➤ DEVIATION AND VIOLATION</li> <li>➤ THE ERROR CHAIN</li> <li>➤ ACTIVE AND LATENT ERRORS</li> <li>➤ ERROR GENERATION</li> <li>➤ INTERNAL ERROR GENERATION</li> <li>➤ EXTERNAL ERROR GENERATION</li> <li>➤ STRATEGIES FOR COPING WITH HUMAN ERROR</li> <li>➤ ERROR MANAGEMENT PROGRAMMES</li> <li>➤ FLIGHT DECK ERGONOMICS</li> <li>➤ SEAT DESIGN</li> <li>➤ DESIGN EYE POINT</li> <li>➤ INSTRUMENT AND DISPLAY DESIGN</li> <li>➤ DESIGN OF CONTROLS</li> <li>➤ DESIGN OF CHECKLISTS AND DOCUMENTATION</li> <li>➤ WARNING SYSTEMS</li> <li>➤ SUMMARY OF DESIGN PRINCIPLES</li> <li>➤ DECISION MAKING</li> </ul>	

**LECTURE DETAILS**

SUBJECT TITLE: **HUMAN PERFORMANCE AND LIMITATIONS**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **12/12**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

- SAMPLE EXAM
- REVIEW OF SAMPLE TEST ANSWERS
- QUESTIONS & ANSWERS ON ALL TOPICS

<b>SUBJECT DETAILS</b>	
<b>050</b>	<b>METEOROLOGY</b>
INSTRUCTIONAL HOURS:	<b>80</b>
NUMBER OF LECTURES:	<b>16</b>
LECTURE DURATION (WITHOUT BREAK):	<b>5</b>
NUMBER OF PROGRESS TESTS (MINIMUM):	<b>4</b>
NUMBER OF SAMPLE EXAMS (MINIMUM):	<b>1</b>
<b>GENERAL DESCRIPTION &amp; OBJECTIVES OF SUBJECT TRAINING</b>	
<ul style="list-style-type: none"> <li>✓ THE ATMOSPHERE</li> <li>✓ WIND</li> <li>✓ THERMODYNAMICS</li> <li>✓ CLOUDS AND FOG</li> <li>✓ PRECIPITATION</li> <li>✓ AIRMASSES AND FRONTS</li> <li>✓ PRESSURE SYSTEMS</li> <li>✓ CLIMATOLOGY</li> <li>✓ FLIGHT HAZARDS</li> <li>✓ METEOROLOGICAL INFORMATION</li> </ul>	



**TRAINING MANUAL  
PART 4  
Theoretical Knowledge  
Instruction**

Page: 126  
Revision: 1  
Date: 6 Feb 2009

**INTENTIONALLY LEFT BLANK**



**LECTURE DETAILS**

SUBJECT TITLE:

**METEOROLOGY**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **1/16**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

THE ATMOSPHERE

- COMPOSITION, EXTEND, VERTICAL DIVISION
- TEMPERATURE
- VERTICAL DISTRIBUTION OF TEMPERATURE
- TRANSFER OF HEAT
- SOLAR AND TERRESTRIAL RADIATION
- CONDUCTION
- CONVECTION
- ADVECTION AND TURBULENCE
- LAPS RATE, STABILITY AND INSTABILITY
- DEVELOPMENT OF INVERSIONS, TYPES OF INVERSIONS
- TEMPERATURE NEAR THE EARTH'S SURFACE, SURFACE EFFECTS, DIURNAL VARIATION, EFFECT OF CLOUDS, EFFECT OF WIND
- ATMOSPHERIC PRESSURE
- BAROMETRIC PRESSURE, ISOBARS

**LECTURE DETAILS**

SUBJECT TITLE:

**METEOROLOGY**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **2/16**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

THE ATMOSPHERE

- BAROMETRIC PRESSURE, ISOBARS
- PRESSURE VARIATION WITH THE HEIGHT
- REDUCTION OF PRESSURE TO MEAN SEA LEVEL
- SURFACE LOW/UPPER-AIR LOW, SURFACE HIGH/UPPER-AIR HIGH
- ATMOSPHERIC DENSITY
- INTERRELATIONSHIP OF PRESSURE, TEMPERATURE AND DENSITY
- INTERNATIONAL STANDARD ATMOSPHERE (ISA)
- ALTIMETRY
- PRESSURE ALTITUDE, DENSITY ALTITUDE, TRUE ALTITUDE
- HEIGHT, ALTITUDE. FLIGHT LEVEL
- QNH, QFE, QFF, STANDARD SETTING
- CALCULATION OF TERRAIN CLEARANCE, LOWEST USABLE FLIGHT LEVEL, RULE OF THUMB FOR TEMPERATURE AND PRESSURE INFLUENCES
- EFFECT OF ACCELERATED AIRFLOW DUE TO TOPOGRAPHY

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>METEOROLOGY</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>3/16</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>WIND</p> <ul style="list-style-type: none"> <li>➤ DEFINITION AND MEASUREMENT</li> <li>➤ PRIMARY CAUSE OF WIND</li> <li>➤ PRIMARY CAUSE OF WIND, PRESSURE GRADIENT, CORIOLIS FORCE, GRADIEND WIND</li> <li>➤ RELATIONSHIP BETWEEN ISOBARS AND WIND</li> <li>➤ EFFECTS OF CONVERGENCE AND DIVERGENCE</li> <li>➤ GENERAL CIRCULATION</li> <li>➤ GENERAL CIRCULATION AROUND THE GLOBE</li> <li>➤ TURBULENCE</li> <li>➤ TURBULENCE AND GUSTINESS, TYPES OF TURBULENCE</li> </ul>	

**LECTURE DETAILS**

SUBJECT TITLE:

**METEOROLOGY**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **4/16**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

WIND

- ORIGIN AND LOCATION OF TURBULENCE
- VARIATION OF WIND WITH HEIGHT
- VARIATION OF WIND IN THE FRICTION LAYER
- LOCAL WINDS
- ANABATIC AND CATABATIC WINDS, LAND AND SEA BREEZES, VENTURI EFFECTS
- JET STREAMS
- DESCRIPTION AND LOCATION OF JET STREAMS
- NAMES, HEIGHTS AND SEASONAL OCCURRENCE OF JET STREAMS
- JET STREAM RECOGNITION
- CAT: CAUSE, LOCATION AND FORECASTING
- STANDING WAVES
- ORIGIN OF STANDING WAVES
- PROGRESS TEST
- REVIEW OF PROGRESS TEST ANSWERS
- QUESTIONS & ANSWERS ON ALL TOPICS

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>METEOROLOGY</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>5/16</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>THERMODYNAMICS</p> <ul style="list-style-type: none"> <li>➤ HUMIDITY</li> <li>➤ WATER VAPOR IN THE ATMOSPHERE</li> <li>➤ TEMPERATURE / DEWPOINT, MIXING RATIO, RELATIVE HUMIDITY</li> <li>➤ CHANGE OF STATE OF AGGREGATION</li> <li>➤ CONDENSATION, EVAPORATION, SUBLIMATION, FREEZING AND MELTING, LATEND HEAT</li> <li>➤ ADIABATIC PROCESSES</li> </ul>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>METEOROLOGY</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>6/16</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>CLOUDS AND FOG</p> <ul style="list-style-type: none"> <li>➤ FLYING CONDITIONS IN EACH CLOUD TYPE</li> <li>➤ FOG, MIST, HAZE</li> <li>➤ RADIATION FOG</li> <li>➤ ADVECTION FOG</li> <li>➤ STEAMING FOG</li> <li>➤ OROGRAPHIC FOG</li> </ul>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>METEOROLOGY</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>7/16</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>CLOUDS AND FOG</p> <ul style="list-style-type: none"> <li>➤ FLYING CONDITIONS IN EACH CLOUD TYPE</li> <li>➤ FOG, MIST, HAZE</li> <li>➤ RADIATION FOG</li> <li>➤ ADVECTION FOG</li> <li>➤ STEAMING FOG</li> <li>➤ OROGRAPHIC FOG</li> </ul>	

**LECTURE DETAILS**

SUBJECT TITLE:

**METEOROLOGY**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **8/16**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

PRECIPITATION

- DEVELOPMENT OF PRECIPITATION
- TYPES OF PRECIPITATION
- TYPES OF PRECIPITATION, RELATIONSHIP WITH CLOUD TYPES
- PROGRESS TEST
- REVIEW OF PROGRESS TEST ANSWERS
- QUESTIONS & ANSWERS ON ALL TOPICS



**LECTURE DETAILS**

SUBJECT TITLE:

**METEOROLOGY**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **9/16**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

**AIRMASSES AND FRONTS**

- TYPES OF AIRMASSES
- DESCRIPTION, FACTORS AFFECTING THE PROPERTIES OF AN AIRMASS
- CLASSIFICATION OF AIRMASSES, MODIFICATIONS OF AIRMASSES, AREAS OF ORIGIN
- FRONDS
- BOUNDARIES BETWEEN AIRMASSES, GENERAL SITUATION, GEOGRAPHIC DIFFERENTIATION, FRONDS
- WARM FROND, ASSOCIATED CLOUDS AND WEATHER
- COLD FROND, ASSOCIATED CLOUDS AND WEATHER
- WARM SECTOR, ASSOCIATED CLOUDS AND WEATHER
- WEATHER BEHIND THE COLD FROND
- STATIONARY FROND, ASSOCIATED CLOUDS AND WEATHER
- MOVEMENT OF FRONDS AND PRESSURE SYSTEMS, LIFE CYCLE

**LECTURE DETAILS**

SUBJECT TITLE:

**METEOROLOGY**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **10/16**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

PRESSURE SYSTEMS

- LOCATION OF THE PRINCIPAL AREAS
- ANTICYCLONE
- ANTICYCLONES, TYPES, GENERAL PROPERTIES, COLD AND WARM ANTICYCLONES, RIDGES AND WEDGES, SUBSIDENCE
- NON FRONTAL DEPRESSIONS
- THERMAL, OROGRAPHIC AND SECONDARY DEPRESSIONS, COLD AIR POOLS, TROUGHES
- TROPICAL REVOLVING STORMS
- ORIGIN AND LOCAL NAMES, LOCATION AND PERIOD OF OCCURRENCE
- PROGRESS TEST
- REVIEW OF PROGRESS TEST ANSWERS
- QUESTIONS & ANSWERS ON ALL TOPICS

**LECTURE DETAILS**

SUBJECT TITLE:

**METEOROLOGY**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **11/16**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

CLIMATOLOGY

- CLIMATIC ZONES
- GENERAL SEASONAL CIRCULATION IN THE TROPOSPHERE AND LOWER STRATOSPHERE
- TROPICAL RAIN CLIMATE, DRY CLIMATE, MID-LATITUDE CLIMATE, SUB-ARCTICAL CLIMATE WITH COLD WINTER, SNOWCLIMATE
- TROPICAL CLIMATOLOGY
- CAUSE AND DEVELOPMENT OF TROPICAL SHOWERS: HUMIDITY, TEMPERATURE, TROPOPAUSE
- SEASONAL VARIATIONS OF WEATHER AND WIND, TYPICAL SYNOPTIC SITUATIONS
- INTERTROPICAL CONVERGENCE ZONE (ITCZ), WEATHER IN THE ITCZ, GENERAL SEASONAL MOVEMENT

**LECTURE DETAILS**

SUBJECT TITLE:

**METEOROLOGY**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **12/16**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

CLIMATOLOGY

- CLIMATIC ELEMENTS RELATIVE TO THE AREA (MONSOON, TRADEWINDS, SANDSTORMS, COLD AIR OUTBREAKS)
- EASTERLY WAVES
- TYPICAL WEATHER SITUATIONS IN MID-LATITUDES
- WESTERLY WAVES
- HIGH PRESSURE AREA
- UNIFORM PRESSURE PATTERN
- COLD POOL
- LOCAL SEASONAL WEATHER AND WINDS
- LOCAL SEASONAL WEATHER AND WIND, E.G. FOEHN, MISTRAL, BORA, SCIROCCO, HARMATTAN, GIBBLI AND PAMPERRO
- AVIATION CLIMATOLOGY
- PROGRESS TEST
- REVIEW OF PROGRESS TEST ANSWERS
- QUESTIONS & ANSWERS ON ALL TOPICS

**LECTURE DETAILS**

SUBJECT TITLE:

**METEOROLOGY**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **13/16**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

FLIGHT HAZARDS

- ICING
- WEATHER CONDITIONS FOR ICE ACCRETION, TOPOGRAPHICAL EFFECTS
- TYPES OF ICE ACCRETION
- HAZARDS OF ICE ACCRETION, AVOIDANCE
- TURBULENCE
- EFFECTS ON FLIGHT, AVOIDANCE
- CAT: EFFECTS ON FLIGHT
- WINDSHEAR
- WEATHER CONDITIONS FOR VERTICAL WINDSHEARS
- WEATHER CONDITIONS FOR HORIZONTAL WINDSHEARS
- EFFECTS ON FLIGHT
- THUNDERSTORMS
- STRUCTURE OF THUNDERSTORMS, SQUALL LINES, LIFE HISTORY, STORM CELLS, ELECTRICITY IN THE
- ATMOSPHERE, STATIC CHARGES
- CONDITIONS FOR AND PROCESS OF DEVELOPMENT, FORECAST,
- LOCATION, TYPE SPECIFICATION
- THUNDERSTORM AVOIDANCE, GROUND/AIRBORNE RADAR STORMSCOPE

**LECTURE DETAILS**

SUBJECT TITLE:

**METEOROLOGY**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **14/16**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

FLIGHT HAZARDS

- DEVELOPMENT AND EFFECT OF DOWNBURSTS
- DEVELOPMENT OF LIGHTNING DISCHARGES AND EFFECT OF LIGHTNING STRIKE ON AIRCRAFT
- AND FLIGHT EXECUTION
- TORNADOES
- OCCURRENCE
- LOW AND HIGH INVERSIONS
- INFLUENCE ON AIRCRAFT PERFORMANCE
- STRATOSPHERIC CONDITIONS
- TROPOPAUSE INFLUENCE ON AIRCRAFT PERFORMANCE
- EFFECT OF OZON, RADIOACTIVITY
- HAZARDS IN MOUNTAINOUS AREAS
- INFLUENCE OF TERRAIN IN CLOUDS AND PRECIPITATION, FRONTAL PASSAGE
- VERTICAL MOVEMENTS, MOUNTAINWAVE, WINDSHEAR, TURBULENCE, ICE ACCRETION
- DEVELOPMENT AND EFFECT OF VALLEY INVERSIONS
- VISIBILITY REDUCING PHENOMENA
- REDUCTION OF VISIBILITY CAUSED BY MIST, SMOKE, DUST, SAND AND PRECIPITATION
- REDUCTION OF VISIBILITY CAUSED BY LOW DRIFTING AND BLOWING SNOW
- PROGRESS TEST
- REVIEW OF PROGRESS TEST ANSWERS
- QUESTIONS & ANSWERS ON ALL TOPICS

**LECTURE DETAILS**

SUBJECT TITLE:

**METEOROLOGY**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **15/16**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

METEOROLOGICAL INFORMATION

- OBSERVATION
- ON THE GROUND: SURFACE WIND, VISIBILITY AND RUNWAY VISUAL RANGE,
- TRANSMISSOMETERS
- CLOUD: TYPE, AMOUNT, HEIGHT OF BASE AND TOPS, MOVEMENT
- WEATHER: INCLUDING ALL TYPES OF PRECIPITATION, AIR TEMPERATURE, RELATIVE HUMIDITY, DEW POINT
- ATMOSPHERIC PRESSURE
- UPPER AIR OBSERVATIONS
- SATELLITE OBSERVATIONS, INTERPRETATION
- WEATHER RADAR OBSERVATIONS GROUND AND AIRBORNE, INTERPRETATION
- AIRCRAFT OBSERVATIONS AND REPORTING, DATA LINK SYSTEMS, ADSAR SOUNDING, PIREPS

**LECTURE DETAILS**

SUBJECT TITLE:

**METEOROLOGY**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **16/16**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

METEOROLOGICAL INFORMATION

- WEATHER CHARTS
- CHARTS OF SIGNIFICANT WEATHER, TROPOPAUSE, MAXIMUM WIND
- SURFACE CHARTS
- UPPER AIR CHARTS
- SYMBOLS AND SIGNS ON ANALYZED AND PROGNOSTIC CHARTS
- INFORMATION ON FLIGHT PLANNING
- AERONAUTICAL CODES: METAR, TAF, SPECI, SIGMET, SNOWTAM, MONTE,
- RUNWAY REPORT
- METEOROLOGICAL BROADCASTS FOR NAVIGATION: VOLMET, ATIS, HF-VOLMET, ACARS
- CONTENT AND USE OF PRE-FLIGHT METEOROLOGICAL DOCUMENTS
- METEOROLOGICAL BRIEFING AND ADVICE
- MEASURING AND WARNING SYSTEMS FOR LOW LEVEL WINDSHEAR, INVERSION
- SPECIAL METEOROLOGICAL WARNINGS
- INFORMATION FOR COMPUTER FLIGHT PLANNING
- SAMPLE EXAM
- REVIEW OF SAMPLE TEST ANSWERS
- QUESTIONS & ANSWERS ON ALL TOPICS



<b>SUBJECT DETAILS</b>	
<b>061</b>	<b>GENERAL NAVIGATION</b>
INSTRUCTIONAL HOURS:	<b>70</b>
NUMBER OF LECTURES:	<b>14</b>
LECTURE DURATION (WITHOUT BREAK):	<b>5</b>
NUMBER OF PROGRESS TESTS (MINIMUM):	<b>3</b>
NUMBER OF SAMPLE EXAMS (MINIMUM):	<b>1</b>
<b>GENERAL DESCRIPTION &amp; OBJECTIVES OF SUBJECT TRAINING</b>	
<ul style="list-style-type: none"> <li>✓ DIRECTION &amp; DEFINITIONS</li> <li>✓ POSITION AND DISTANCE</li> <li>✓ LINES ON THE EARTH</li> <li>✓ MAPS AND CHARTS</li> <li>✓ GRID NAVIGATION</li> <li>✓ TEMPERATURES, HEIGHTS AND SPEEDS</li> <li>✓ MAGNETISM AND COMPASSES</li> <li>✓ REMOTE INDICATING GYRO COMPASSES</li> <li>✓ PRACTICAL NAVIGATION</li> <li>✓ CONTINGENCY PLANNING, DR &amp; VFR NAVIGATION</li> <li>✓ INERTIAL NAVIGATION</li> </ul>	



**TRAINING MANUAL  
PART 4  
Theoretical Knowledge  
Instruction**

Page: 144  
Revision: 1  
Date: 6 Feb 2009

**INTENTIONALLY LEFT BLANK**

**LECTURE DETAILS**

SUBJECT TITLE: **GENERAL NAVIGATION**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **1/14**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

**DIRECTION & DEFINITIONS**

- THE EARTH
- THE POLES
- NORTH AND SOUTH
- EAST AND WEST
- LATITUDE AND LONGITUDE
- DIRECTION
- TRUE DIRECTION
- MAGNETIC DIRECTION
- COMPASS DIRECTION
- CALCULATION OF TRUE DIRECTION

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>GENERAL NAVIGATION</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>2/14</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>POSITION AND DISTANCE</p> <ul style="list-style-type: none"> <li>➤ LATITUDE</li> <li>➤ CHANGE OF LATITUDE</li> <li>➤ LONGITUDE</li> <li>➤ CHANGE OF LONGITUDE</li> <li>➤ DISTANCE</li> <li>➤ DEPARTURE</li> <li>➤ DISTANCE OVER THE POLES</li> <li>➤ THE EFFECT OF THE DISTORTED SPHERE</li> <li>➤ THE RATIO OF ELASTICITY</li> <li>➤ GEOCENTRIC &amp; GEODETIC LATITUDES</li> </ul>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>GENERAL NAVIGATION</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>3/14</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>LINES ON THE EARTH</p> <ul style="list-style-type: none"> <li>➤ GREAT CIRCLES</li> <li>➤ WORKING WITH GREAT CIRCLES</li> <li>➤ RHUMB LINES</li> <li>➤ SUMMARY</li> <li>➤ GREAT CIRCLES</li> <li>➤ RHUMB LINES</li> <li>➤ PROGRESS TEST</li> <li>➤ REVIEW OF PROGRESS TEST ANSWERS</li> <li>➤ QUESTIONS &amp; ANSWERS ON ALL TOPICS</li> </ul>	

**LECTURE DETAILS**

SUBJECT TITLE:

**GENERAL NAVIGATION**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **4/14**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

MAPS AND CHARTS

- MAPS
- THE CORRECT SHAPE SCALE
- MERCATOR'S PROJECTION SCALE
- GREAT CIRCLES AND RHUMB LINES SUMMARY
- THE SIMPLE CONIC PROJECTION
- LAMBERTS PROJECTION
- CHART CONVERGENCY SCALE
- GREAT CIRCLES AND RHUMB LINES SUMMARY
- THE TRANSVERSE MERCATOR SCALE CONVERGENCY
- GREAT CIRCLES AND RHUMB LINES SUMMARY
- THE OBLIQUE MERCATOR SUMMARY
- THE POLAR STEREOGRAPHIC SCALE
- RADIUS OF A PARALLEL OF LATITUDE
- GREAT CIRCLES AND RHUMB LINES SUMMARY

**LECTURE DETAILS**

SUBJECT TITLE:

**GENERAL NAVIGATION**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **5/14**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

GRID NAVIGATION

- CONVERGENCE
- GRIDS ON LAMBERTS CHARTS

**LECTURE DETAILS**

SUBJECT TITLE:

**GENERAL NAVIGATION**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **6/14**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

TEMPERATURES, HEIGHTS AND SPEEDS

- TEMPERATURES
- CALCULATION OF TEMPERATURE DEVIATION
- TAT AND SAT
- HEIGHT
- ALTIMETRY PROCEDURES
- ALTIMETRY ERRORS AND PROBLEMS
- TEMPERATURE ERRORS
- DENSITY ALTITUDE
- CALCULATION OF GLIDE PATH HEIGHT
- CALCULATING RATES OF DESCENT ON A GLIDEPATH
- SPEED
- RASANDTAS
- MACH NUMBERS
- SPEED, DISTANCE & TIME CALCULATIONS
- FUEL CALCULATIONS
- FUEL CONVERSIONS
- PROGRESS TEST
- REVIEW OF PROGRESS TEST ANSWERS
- QUESTIONS & ANSWERS ON ALL TOPICS



<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>GENERAL NAVIGATION</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>7/14</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>MAGNETISM AND COMPASSES</p> <ul style="list-style-type: none"> <li>➤ MAGNETISM</li> <li>➤ THE MOLECULAR THEORY OF MAGNETISM</li> <li>➤ MAGNETIC FIELDS</li> <li>➤ THE EARTH'S MAGNETISM</li> <li>➤ THE DIRECT READING COMPASS</li> <li>➤ PRINCIPLE OF OPERATION</li> <li>➤ THE E TYPE COMPASS ERRORS</li> <li>➤ ACCELERATION ERRORS</li> <li>➤ TURN ING ERRORS</li> </ul>	

**LECTURE DETAILS**

SUBJECT TITLE:

**GENERAL NAVIGATION**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **8/14**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

REMOTE INDICATING GYRO COMPASSES

- INTRODUCTION
- THE FLUX DETECTOR UNIT
- MEASURING THE COMPONENT OF H IN EACH LEG
- TRANSMITTING THE SIGNAL
- THE GYRO UNIT
- HEADING TRANSMISSION
- SYNCHRONISATION
- USE AS A DIRECTIONAL GYRO
- SYSTEM ERRORS
- THE INERTIAL REFERENCE SYSTEM DEVIATION
- OTHER CAUSES OF DEVIATION
- CHANGES IN DEVIATING FORCES
- REASONS TO SWING THE COMPASS

**LECTURE DETAILS**

SUBJECT TITLE:

**GENERAL NAVIGATION**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **9/14**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

PRACTICAL NAVIGATION

- INTRODUCTION
- HEADING, TRACK AND DRIFT
- HEADING
- TRACK OR COURSE
- DRIFT
- WIND CALCULATIONS
- WIND FINDING
- FINDING HEADING AND GROUND SPEED
- FINDING THE TRACK AND GROUND SPEED
- BEARINGS
- RELATIVE BEARINGS
- SYMBOLS & CHARTS
- CONVENTIONAL PLOTTING SYMBOLS
- CHART SYMBOLS
- LINE SYMBOLS
- OTHER SYMBOLS
- PLOTTING CHARTS
- PLOTTING
- PLOTTING RADIALS
- PLOTTING DISTANCES
- PLOTTING TRUE TRACKS
- PLOTTING FIXES

**LECTURE DETAILS**

SUBJECT TITLE:

**GENERAL NAVIGATION**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **10/14**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

PRACTICAL NAVIGATION (REPETITION)

- INTRODUCTION
- HEADING, TRACK AND DRIFT
- HEADING
- TRACK OR COURSE
- DRIFT
- WIND CALCULATIONS
- WIND FINDING
- FINDING HEADING AND GROUND SPEED
- FINDING THE TRACK AND GROUND SPEED
- BEARINGS
- RELATIVE BEARINGS
- SYMBOLS & CHARTS
- CONVENTIONAL PLOTTING SYMBOLS
- CHART SYMBOLS
- LINE SYMBOLS
- OTHER SYMBOLS
- PLOTTING CHARTS
- PLOTTING
- PLOTTING RADIALS
- PLOTTING DISTANCES
- PLOTTING TRUE TRACKS
- PLOTTING FIXES

PROGRESS TEST

REVIEW OF PROGRESS TEST ANSWERS

QUESTIONS & ANSWERS ON ALL TOPICS

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>GENERAL NAVIGATION</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>11/14</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>CONTINGENCY PLANNING, DR &amp; VFR NAVIGATION</p> <ul style="list-style-type: none"> <li>➤ THE RADIUS OF ACTION</li> <li>➤ CRITICAL POINT</li> <li>➤ THE CIRCLE OF UNCERTAINTY</li> <li>➤ VISUAL NAVIGATION AND MAP READING</li> <li>➤ INTRODUCTION</li> <li>➤ ROUTE PLANNING</li> <li>➤ IN-FLIGHT PROCEDURES</li> <li>➤ SPEED ADJUSTMENT</li> <li>➤ CALCULATION OF TOP OF DESCENT POSITION OR RATE OF DESCENT</li> </ul> <p>PROGRESS TEST REVIEW OF PROGRESS TEST ANSWERS QUESTIONS &amp; ANSWERS ON ALL TOPICS</p>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>GENERAL NAVIGATION</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>12/14</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>INITIAL NAVIGATION</p> <ul style="list-style-type: none"> <li>➤ BASIC PRINCIPLES</li> <li>➤ INERTIAL ACCELEROMETERS</li> <li>➤ RATE INTEGRATING GYROS</li> <li>➤ THE ACCELERATION AXES</li> <li>➤ STABLE PLATFORMS AND STRAP DAWN SYSTEMS</li> <li>➤ THE STABLE PLATFORM INS</li> <li>➤ KEEPING THE PLATFORM LEVEL AND ALIGNED</li> <li>➤ INITIAL ALIGNMENT AND LEVELING</li> <li>➤ NAVIGATION</li> <li>➤ ATTITUDE OUTPUTS</li> <li>➤ CONTROLS AND INDICATORS</li> <li>➤ THE MSU</li> <li>➤ THE CONTROL DISPLAY UNIT</li> <li>➤ SETTING UP</li> <li>➤ INS NORMAL OPERATION</li> <li>➤ THE WANDER ANGLE INS</li> <li>➤ THE STRAP DOWN IRU</li> <li>➤ INITIAL ALIGNMENT AND LEVELING</li> <li>➤ NAVIGATION</li> <li>➤ CONTROLS AND INDICATORS</li> <li>➤ SETTING UP</li> <li>➤ FAST REALIGNMENT</li> </ul>	

**LECTURE DETAILS**

SUBJECT TITLE:

**GENERAL NAVIGATION**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **13/14**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

- MAPS AND CHARTS (PRACTICAL EXCERSICES)
- PRACTICAL NAVIGATION
- POSITION AND DISTANCE

**LECTURE DETAILS**

SUBJECT TITLE:

**GENERAL NAVIGATION**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **14/14**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

- SAMPLE EXAM
- REVIEW OF SAMPLE TEST ANSWERS
- QUESTIONS & ANSWERS ON ALL TOPICS



<b>SUBJECT DETAILS</b>	
<b>062</b>	<b>RADIO NAVIGATION</b>
INSTRUCTIONAL HOURS:	<b>70</b>
NUMBER OF LECTURES:	<b>14</b>
LECTURE DURATION (WITHOUT BREAK):	<b>5</b>
NUMBER OF PROGRESS TESTS (MINIMUM):	<b>4</b>
NUMBER OF SAMPLE EXAMS (MINIMUM):	<b>1</b>
<b>GENERAL DESCRIPTION &amp; OBJECTIVES OF SUBJECT TRAINING</b>	
<ul style="list-style-type: none"><li>✓ RADIO AIDS</li><li>✓ BASIC RADAR PRINCIPLES</li><li>✓ AREA NAVIGATION SYSTEMS</li><li>✓ SELF-CONTAINED AND EXTERNAL-REFERENCED</li><li>✓ NAVIGATION SYSTEMS</li></ul>	



**TRAINING MANUAL  
PART 4  
Theoretical Knowledge  
Instruction**

Page: 160  
Revision: 1  
Date: 6 Feb 2009

**INTENTIONALLY LEFT BLANK**

**LECTURE DETAILS**

SUBJECT TITLE:

**RADIO NAVIGATION**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **1/14**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

RADIO AIDS

GROUND D/F ( INCLUDING CLASSIFICATION OF BEARINGS)

- PRINCIPLES
- PRESENTATION AND INTERPRETATION
- COVERAGE
- RANGE
- ERRORS AND ACCURACY
- FACTORS AFFECTING RANGE AND ACCURACY

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>RADIO NAVIGATION</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>2/14</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>RADIO AIDS</p> <p>NON DIRECTION BEACONS (NDB), AUTOMATIC DIRECTION FINDER (ADF), INCLUDING ASSOCIATED BEACONS AND USE OF THE RADIO MAGNETIC INDICATOR (RMI)</p> <ul style="list-style-type: none"> <li>➤ PRINCIPLES</li> <li>➤ PRESENTATION AND INTERPRETATION</li> <li>➤ COVERAGE</li> <li>➤ RANGE</li> <li>➤ ERRORS AND ACCURACY</li> <li>➤ FACTORS AFFECTING RANGE AND ACCURACY</li> </ul>	

**LECTURE DETAILS**

SUBJECT TITLE:

**RADIO NAVIGATION**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **3/14**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

RADIO AIDS

VHF OMNIDIRECTIONAL RADIORANGE (VOR), DOPPLER VOR, INCLUDING THE USE OF THE RADIO MAGNETIC INDICATOR (RMI), AND THE HORIZONTAL SITUATION INDICATOR (HSI)

- PRINCIPLES
- PRESENTATION AND INTERPRETATION
- COVERAGE
- RANGE
- ERRORS AND ACCURACY
- FACTORS AFFECTING RANGE AND ACCURACY

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>RADIO NAVIGATION</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>4/14</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>RADIO AIDS</p> <p>DISTANCE MEASURING EQUIPMENT (DME)</p> <ul style="list-style-type: none"> <li>➤ PRINCIPLES</li> <li>➤ PRESENTATION AND INTERPRETATION</li> <li>➤ COVERAGE</li> <li>➤ RANGE</li> <li>➤ ERRORS AND ACCURACY</li> <li>➤ FACTORS AFFECTING RANGE AND ACCURACY</li> </ul> <p>PROGRESS TEST REVIEW OF PROGRESS TEST ANSWERS QUESTIONS &amp; ANSWERS ON ALL TOPICS</p>	

**LECTURE DETAILS**

SUBJECT TITLE: **RADIO NAVIGATION**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **5/14**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

RADIO AIDS

INSTRUMENT LANDING SYSTEM (ILS)

- PRINCIPLES
- PRESENTATION AND INTERPRETATION
- COVERAGE
- RANGE
- ERRORS AND ACCURACY
- FACTORS AFFECTING RANGE AND ACCURACY

**LECTURE DETAILS**

SUBJECT TITLE: **RADIO NAVIGATION**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **6/14**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

RADIO AIDS

MICROWAVE LANDING SYSTEM (MLS)

- PRINCIPLES
- PRESENTATION AND INTERPRETATION
- COVERAGE
- RANGE
- ERRORS AND ACCURACY
- FACTORS AFFECTING RANGE AND ACCURACY



<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>RADIO NAVIGATION</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>7/14</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>RADIO AIDS</p> <p>DIFFERENTIAL GPS (DGPS)</p> <ul style="list-style-type: none"> <li>➤ PRINCIPLES</li> <li>➤ PRESENTATION AND INTERPRETATION</li> <li>➤ COVERAGE</li> <li>➤ RANGE</li> <li>➤ ERRORS AND ACCURACY</li> <li>➤ FACTORS AFFECTING RANGE AND ACCURACY</li> </ul> <p>PROGRESS TEST REVIEW OF PROGRESS TEST ANSWERS QUESTIONS &amp; ANSWERS ON ALL TOPICS</p>	

**LECTURE DETAILS**

SUBJECT TITLE: **RADIO NAVIGATION**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **8/14**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

**BASIC RADAR PRINCIPLES**

- PULSE TECHNIQUES AND ASSOCIATED TERMS
- GROUND RADAR
- PRINCIPLES
- PRESENTATION AND INTERPRETATION
- COVERAGE
- RANGE
- ERRORS AND ACCURACY
- FACTORS AFFECTING RANGE AND ACCURACY

**LECTURE DETAILS**

SUBJECT TITLE:

**RADIO NAVIGATION**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **9/14**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

**BASIC RADAR PRINCIPLES**

- AIRBORNE WEATHER RADAR
- PRINCIPLES
- PRESENTATION AND INTERPRETATION
- COVERAGE
- RANGE
- ERRORS AND ACCURACY
- FACTORS AFFECTING RANGE AND ACCURACY
- APPLICATION FOR NAVIGATION
- SECONDARY SURVEILLANCE RADAR AND TRANSPONDER (SSR)
- PRINCIPLES
- PRESENTATION AND INTERPRETATION
- MODES AND CODES, INCLUDING MODE S
- USE OF RADAR OBSERVATIONS AND APPLICATION TO IN FLIGHT NAVIGATION

**PROGRESS TEST**

REVIEW OF PROGRESS TEST ANSWERS  
QUESTIONS & ANSWERS ON ALL TOPICS

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>RADIO NAVIGATION</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>10/14</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>AREA NAVIGATION SYSTEMS</p> <p>GENERAL PHILOSOPHY</p> <ul style="list-style-type: none"> <li>➤ USE OF RADIO NAVIGATION SYSTEMS OR AN INERTIAL NAVIGATION SYSTEM</li> <li>➤ TYPICAL FLIGHT DECK EQUIPMENT AND OPERATION</li> <li>➤ MEANS OF ENTERING AND SELECTING WAYPOINTS AND DESIRED COURSE INFORMATION</li> <li>➤ (KEYBOARD ENTRY SYSTEM)</li> <li>➤ MEANS OF SELECTING, TUNING AND IDENTIFYING GROUND STATIONS</li> </ul>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>RADIO NAVIGATION</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>11/14</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>AREA NAVIGATION SYSTEMS (REPETITION)</p> <p>GENERAL PHILOSOPHY</p> <ul style="list-style-type: none"> <li>➤ USE OF RADIO NAVIGATION SYSTEMS OR AN INERTIAL NAVIGATION SYSTEM</li> <li>➤ TYPICAL FLIGHT DECK EQUIPMENT AND OPERATION</li> <li>➤ MEANS OF ENTERING AND SELECTING WAYPOINTS AND DESIRED COURSE INFORMATION</li> <li>➤ (KEYBOARD ENTRY SYSTEM)</li> <li>➤ MEANS OF SELECTING, TUNING AND IDENTIFYING GROUND STATIONS</li> </ul>	

**LECTURE DETAILS**

SUBJECT TITLE:

**RADIO NAVIGATION**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **12/14**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

AREA NAVIGATION SYSTEMS

INSTRUMENTATION FOR EN-ROUTE COURSE GUIDANCE FOR SOME TYPES OF SYSTEMS,  
INSTRUMENTATION FOR PRESENTING DISTANCE TRAVELED, DISTANCE TO GO AND, IF  
NECESSARY, GROUND SPEED INFORMATION

- INSTRUMENTATION FOR PRESENTING CURRENT POSITION DATA
- INSTRUMENT INDICATIONS
- TYPES OF AREA NAVIGATION SYSTEM INPUTS
- SELF CONTAINED ON BOARD SYSTEMS (INERTIAL NAVIGATION SYSTEMS, DOPPLER)
- EXTERNAL SENSOR SYSTEMS (VOR/DME, OMEGA, LORAN-C DECCA)
- AIR DATA INPUTS (TRUE AIRSPEED, ALTITUDE, MAGNETIC HEADING)
- VOR/DME AREA NAVIGATION (RNAV)
- PRINCIPLE OF OPERATION
- ADVANTAGES AND DISADVANTAGES
- ACCURACY, RELIABILITY, COVERAGE
- FLIGHT DECK EQUIPMENT
- FLIGHT DIRECTOR AND AUTOPILOT COUPLING

PROGRESS TEST

REVIEW OF PROGRESS TEST ANSWERS  
QUESTIONS & ANSWERS ON ALL TOPICS

**LECTURE DETAILS**

SUBJECT TITLE:

**RADIO NAVIGATION**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **13/14**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

SELF-CONTAINED AND EXTERNAL-REFERENCED  
NAVIGATION SYSTEMS

- DOPPLER
- PRINCIPLES OF OPERATION (AIRBORNE SYSTEM)
- GROUND SPEED AND DRIFT CALCULATION
- ADVANTAGES AND DISADVANTAGES
- ACCURACY AND RELIABILITY
- FLIGHT DECK EQUIPMENT
- VERY LOW FREQUENCY SYSTEMS (OMEGA AND VLF)
- PRINCIPLES OF OPERATION
- DERIVATION OF POSITION LINE
- ADVANTAGES AND DISADVANTAGES
- GROUND STATION LOCATIONS
- ACCURACY, RELIABILITY, RANGE, COVERAGE
- FLIGHT DECK EQUIPMENT, PRESENTATION OF INFORMATION

**LECTURE DETAILS**

SUBJECT TITLE:

**RADIO NAVIGATION**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **14/14**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

SELF-CONTAINED AND EXTERNAL-REFERENCED  
NAVIGATION SYSTEMS

- LORAN-C
- PRINCIPLE OF OPERATION
- DECCA NAVIGATION SYSTEM
- PRINCIPLE OF OPERATION
- SATELLITE ASSISTED NAVIGATION : GPS/GLONASS
- PRINCIPLE OF OPERATION
- ADVANTAGES AND DISADVANTAGES

SAMPLE EXAM

REVIEW OF SAMPLE TEST ANSWERS  
QUESTIONS & ANSWERS ON ALL TOPICS



<b>SUBJECT DETAILS</b>	
<b>070</b>	<b>OPERATIONAL PROCEDURES</b>
INSTRUCTIONAL HOURS:	<b>30</b>
NUMBER OF LECTURES:	<b>6</b>
LECTURE DURATION (WITHOUT BREAK):	<b>5</b>
NUMBER OF PROGRESS TESTS (MINIMUM):	<b>2</b>
NUMBER OF SAMPLE EXAMS (MINIMUM):	<b>1</b>
<b>GENERAL DESCRIPTION &amp; OBJECTIVES OF SUBJECT TRAINING</b>	
<ul style="list-style-type: none"> <li>✓ GENERAL</li> <li>✓ JAR-OPS - REQUIREMENTS</li> <li>✓ SPECIAL OPERATIONAL PROCEDURES AND HAZARDS (GENERAL ASPECTS)</li> </ul>	



**TRAINING MANUAL  
PART 4  
Theoretical Knowledge  
Instruction**

Page: 176  
Revision: 1  
Date: 6 Feb 2009

**INTENTIONALLY LEFT BLANK**

**LECTURE DETAILS**

SUBJECT TITLE: **OPERATIONAL PROCEDURES**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **1/6**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

GENERAL

- ANNEX 6, PARTS I, II AND III (AS APPLICABLE)
- DEFINITIONS
- APPLICABILITY
- GENERAL FRAMEWORK AND CONTENTS

JAR-OPS - REQUIREMENTS

GENERAL REQUIREMENTS ABOUT:

- QUALITY SYSTEM
- ADDITIONAL CREW MEMBERS
- METHOD OF CARRIAGE OF PERSON
- ADMISSION TO FLIGHT DECK
- UNAUTHORIZED CARRIAGE
- PORTABLE ELECTRONIC DEVICES
- ENDANGERING SAFETY
- ADDITIONAL INFORMATION AND FORMS TO BE CARRIED
- INFORMATION RETAINED ON GROUND
- POWER TO INSPECT
- PRODUCTION OF DOCUMENTATION AND RECORDS
- PRESERVATION OF DOCUMENTATION
- LEASING

OPERATOR CERTIFICATION AND SUPERVISION REQUIREMENTS:

- GENERAL RULES FOR AIR OPERATOR CERTIFICATION
- ISSUE, VARIATION AND CONTINUED VALIDITY OF AN AOC
- ADMINISTRATIVE REQUIREMENTS

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>OPERATIONAL PROCEDURES</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>2/6</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>JAR-OPS - REQUIREMENTS</p> <p>OPERATIONAL PROCEDURES REQUIREMENTS:</p> <ul style="list-style-type: none"> <li>➤ OPERATIONAL CONTROL AND SUPERVISION</li> <li>➤ USE OF AIR TRAFFIC SERVICES</li> <li>➤ INSTRUMENT DEPARTURE AND APPROACH PROCEDURES</li> <li>➤ CARRIAGE A PERSON WITH REDUCED MOBILITY,</li> <li>➤ CARRIAGE OF INADMISSIBLE PASSENGERS</li> <li>➤ DEPORTEES OR PERSONS IN CUSTODY</li> <li>➤ STOWAGE OF BAGGAGE AND CARGO</li> <li>➤ PASSENGERS SEATING</li> <li>➤ SECURING OF PASSENGER CABIN AND GALLEY(S)</li> <li>➤ SMOKING ON BOARD</li> <li>➤ TAKE OFF CONDITIONS</li> <li>➤ APPLICATION OF TAKE OFF MINIMA</li> </ul> <p>ALL WEATHER OPERATIONS REQUIREMENTS:</p> <p>LOW VISIBILITY OPERATIONS:</p> <ul style="list-style-type: none"> <li>➤ AERODROME OPERATING MINIMA - GENERAL</li> <li>➤ TERMINOLOGY</li> <li>➤ LOW VISIBILITY OPERATIONS-GENERAL OPERATING RULES</li> <li>➤ LOW VISIBILITY OPERATIONS-AERODROME CONSIDERATIONS</li> <li>➤ LOW VISIBILITY OPERATIONS-TRAINING AND QUALIFICATIONS</li> <li>➤ LOW VISIBILITY OPERATIONS-OPERATING PROCEDURES</li> <li>➤ LOW VISIBILITY OPERATIONS-MINIMUM EQUIPMENT</li> <li>➤ VFR OPERATING MINIMA</li> </ul> <p>PROGRESS TEST REVIEW OF PROGRESS TEST ANSWERS QUESTIONS &amp; ANSWERS ON ALL TOPICS</p>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>OPERATIONAL PROCEDURES</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>3/6</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>JAR-OPS – REQUIREMENTS</p> <p>INSTRUMENT AND EQUIPMENT REQUIREMENTS:</p> <ul style="list-style-type: none"> <li>➤ GENERAL INTRODUCTION</li> <li>➤ CIRCUIT PROTECTION DEVICES</li> <li>➤ WINDSHIELD WIPERS</li> <li>➤ AIRBORNE WEATHER RADAR EQUIPMENT</li> <li>➤ FLIGHT CREW INTERPHONE SYSTEM</li> <li>➤ PUBLIC ADDRESS SYSTEM</li> <li>➤ INTERNAL DOORS AND CURTAINS</li> </ul> <p>COMMUNICATION AND NAVIGATION EQUIPMENT REQUIREMENTS:</p> <ul style="list-style-type: none"> <li>➤ RADIO EQUIPMENT</li> <li>➤ AUDIO SELECTOR PANEL</li> </ul> <p>COMMUNICATION AND NAVIGATION EQUIPMENT REQUIREMENTS:</p> <ul style="list-style-type: none"> <li>➤ TERMINOLOGY</li> <li>➤ APPLICATION FOR AND APPROVAL OF THE OPERATOR'S MAINTENANCE SYSTEM</li> <li>➤ MAINTENANCE MANAGEMENT</li> <li>➤ QUALITY SYSTEM</li> <li>➤ OPERATOR'S MAINTENANCE MANAGEMENT EXPOSITION</li> <li>➤ OPERATORS AEROPLANE MAINTENANCE PROGRAM</li> <li>➤ CONTINUED VALIDITY OF THE AIR OPERATOR'S CERTIFICATE IN RESPECT OF MAINTENANCE SYSTEM</li> <li>➤ EQUIVALENT SAFETY CASE</li> </ul>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>OPERATIONAL PROCEDURES</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>4/6</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>JAR-OPS – REQUIREMENTS</p> <p>NAVIGATION REQUIREMENTS FOR LONG-RANGE FLIGHTS:</p> <ul style="list-style-type: none"> <li>➤ FLIGHT MANAGEMENT</li> <li>➤ NAVIGATION PLANNING PROCEDURES</li> <li>➤ COMPLETION OF FLIGHT PLANS</li> <li>➤ CHOICE OF ROUTE, SPEED, ALTITUDE</li> <li>➤ SELECTION OF ALTERNATE AERODROME</li> <li>➤ MINIMAL TIME ROUTES, DEFINITION</li> </ul> <p>TRANSOCEANIC AND POLAR FLIGHT (ICAO DOC. 7030 - REGIONAL SUPPLEMENTARY PROCEDURES):</p> <ul style="list-style-type: none"> <li>➤ CHOICE OF THE EMERGENCY MEANS FOR THE DETERMINATION OF COERCE AND INS CROSS-CHECKS</li> <li>➤ DETERMINATION OF TRACKS</li> <li>➤ POLAR TRACKS</li> <li>➤ TERRESTRIAL MAGNETISM CHARACTERISTIC IN POLAR ZONES</li> <li>➤ SPECIFIC PROBLEMS OF POLAR NAVIGATION</li> </ul> <p>MNPS AIRSPACE (ICAO DOC. 7030 - REGIONAL SUPPLEMENTARY PROCEDURES, NAT DOC. 001, T 13 5N/5 - GUIDANCE AND INFORMATION MATERIAL CONCERNING AIR NAVIGATION IN THE NAT REGION, AND NORTH ATLANTIC MNPS AIRSPACE OPERATIONS MANUAL):</p> <ul style="list-style-type: none"> <li>➤ DEFINITION</li> <li>➤ GEOGRAPHICAL LIMITS</li> <li>➤ REGULATIONS AND PROCEDURES</li> <li>➤ NOTICES</li> </ul> <p>PROGRESS TEST REVIEW OF PROGRESS TEST ANSWERS QUESTIONS &amp; ANSWERS ON ALL TOPICS</p>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>OPERATIONAL PROCEDURES</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>5/6</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>SPECIAL OPERATIONAL PROCEDURES AND HAZARDS (GENERAL ASPECTS)</p> <ul style="list-style-type: none"> <li>➤ MINIMUM EQUIPMENT LIST</li> <li>➤ AFM</li> <li>➤ GROUND DE-ICING</li> <li>➤ ICING CONDITIONS</li> <li>➤ DEFINITION AND RECOGNITION, ON GROUND/IN FLIGHT</li> <li>➤ NOISE ABATEMENT</li> <li>➤ INFLUENCE OF THE PROCEDURE (DEPARTURE, CRUISE, APPROACH)</li> <li>➤ INFLUENCE BY THE PILOT (POWER SETTING, LOW DRAG, LOW POWER)</li> <li>➤ FIRE/SMOKE</li> <li>➤ CARBURETOR FIRE</li> <li>➤ ENGINE FIRE</li> <li>➤ DECOMPRESSION OF PRESSURIZED CABIN</li> <li>➤ SLOW DECOMPRESSION</li> <li>➤ EFFECTS AND RECOGNITION DURING DEPARTURE AND APPROACH</li> <li>➤ ACTIONS TAKEN WHEN CROSSING TRAFFIC, DURING TAKE-OFF AND LANDING</li> <li>➤ SECURITY</li> <li>➤ UNLAWFUL EVENTS</li> </ul>	

**LECTURE DETAILS**

SUBJECT TITLE:

**OPERATIONAL PROCEDURES**

DURATION: 5 HOURS

BREAK DURATION:

5 MINS

LECTURE NUMBER:

**6/6**

TOTAL BREAK DURATION:

15 MINS

**CONTENTS & OBJECTIVES**

SPECIAL OPERATIONAL PROCEDURES AND HAZARDS (GENERAL ASPECTS)

- EMERGENCY AND PRECAUTIONARY LANDINGS:
- DEFINITION
- CAUSE

FACTORS TO BE CONSIDERED (WIND, TERRAIN, PREPARATION, FLIGHT TACTICS, LANDING IN VARIOUS TERRAIN AND WATER):

- PASSENGER INFORMATION
- EVACUATION
- ACTIONS AFTER LANDING
- FUEL JETTISONING
- SAFETY ASPECTS
- LEGAL ASPECTS

TRANSPORT OF DANGER GOODS:

- ANNEX 18
- PRACTICAL ASPECTS
- CONTAMINATING RUNWAYS
- KINDS OF CONTAMINATION
- BRAKING ACTION, BRAKE COEFFICIENT
- PERFORMANCE CORRECTIONS AND CALCULATIONS

SAMPLE EXAM

REVIEW OF SAMPLE TEST ANSWERS

QUESTIONS & ANSWERS ON ALL TOPICS



<b>SUBJECT DETAILS</b>	
<b>081</b>	<b>PRINCIPLES OF FLIGHT</b>
INSTRUCTIONAL HOURS:	<b>60</b>
NUMBER OF LECTURES:	<b>12</b>
LECTURE DURATION (WITHOUT BREAK):	<b>5</b>
NUMBER OF PROGRESS TESTS (MINIMUM):	<b>3</b>
NUMBER OF SAMPLE EXAMS (MINIMUM):	<b>1</b>
<b>GENERAL DESCRIPTION &amp; OBJECTIVES OF SUBJECT TRAINING</b>	
<ul style="list-style-type: none"> <li>✓ SUBSONIC AERODYNAMICS</li> <li>✓ TRANSONIC AERODYNAMICS</li> <li>✓ SUPERSONIC AERODYNAMICS</li> <li>✓ STABILITY</li> <li>✓ CONTROL</li> <li>✓ LIMITATIONS</li> <li>✓ PROPELLERS</li> <li>✓ FLIGHT MECHANICS</li> </ul>	



**TRAINING MANUAL  
PART 4  
Theoretical Knowledge  
Instruction**

Page: 184  
Revision: 1  
Date: 6 Feb 2009

**INTENTIONALLY LEFT BLANK**

**LECTURE DETAILS**

SUBJECT TITLE:

**PRINCIPLES OF FLIGHT**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **1/12**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

SUBSONIC AERODYNAMICS

- BASICS, LAWS AND DEFINITIONS
- LAWS AND DEFINITIONS
- UNITS
- LAWS OF NEWTON
- IDEAL GAS EQUATION
- EQUATION OF IMPULSE
- EQUATION OF CONTINUITY
- BERNOULLI'S THEOREM
- STATIC PRESSURE
- DYNAMIC PRESSURE
- VISCOSITY
- DENSITY
- IAS, RAS, EAS, TAS
- BASICS ABOUT AIRFLOW
- STATIONARY AIRFLOW
- NON STATIONARY AIRFLOW
- STREAMLINE
- STREAMTUBE
- TWO-DIMENSIONAL AIRFLOW
- THREE-DIMENSIONAL AIRFLOW
- SHAPE OF AN AEROFOIL
- THICKNESS TO CHORD RATIO
- CHORDLINE
- CAMBERLINE
- NOSE RADIUS
- CAMBER
- ANGLE OF ATTACK
- ANGLE OF INCIDENCE

**LECTURE DETAILS**

SUBJECT TITLE:

**PRINCIPLES OF FLIGHT**

DURATION: 5 HOURS

BREAK DURATION:

5 MINS

LECTURE NUMBER:

**2/12**

TOTAL BREAK DURATION:

15 MINS

**CONTENTS & OBJECTIVES**

**SUBSONIC AERODYNAMICS**

- THE WING SHAPE
- ASPECT RATIO
- ROOT CHORD
- TIP CHORD
- TAPERED WINGS
- SHAPE OF WIND SURFACE
- MEAN AERODYNAMIC CHORD (MAC)
- TWO DIMENSIONAL AIRFLOW ABOUT AN AIRFOIL
- STREAMLINE PATTERN
- STAGNATION POINT
- PRESSURE DISTRIBUTION
- CENTER OF PRESSURE / C.M.A.C.
- LIFT AND DOWNWASH
- DRAG AND WAKE (LOSS OF IMPULSE)
- INFLUENCE OF ANGLE OF ATTACK
- THE LIFT –  $\alpha$  GRAPH
- THE COEFFICIENTS
- THE LIFT COEFFICIENT  $C_Z$
- THE DRAG COEFFICIENT  $C_X$
- THE THREE – DIMENSIONAL AIRFLOW ABOUT AN AEROPLANE
- STREMLINE PATTERN
- INDUCED DRAG
- THE TOTAL DRAG
- THE PARASITE DRAG
- THE PROFILE DRAG AND SPEED
- THE INDUCED DRAG AND SPEED
- THE TOTAL DRAG
- THE TOTAL DRAG AND SPEED
- MINIMUM DRAG

**LECTURE DETAILS**

SUBJECT TITLE:

**PRINCIPLES OF FLIGHT**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **3/12**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

SUBSONIC AERODYNAMICS

- FLOW SEPARATION AT INCREASING ANGLES OF ATTACK
- THE STALL SPEED
- THE INITIAL STALL IN SPAN-WISE DIRECTION
- STALL WARNING
- IMPORTANCE OF STALL WARNING
- STICK SHAKER
- RECOVERY FROM STALL
- SPECIAL PHENOMENA OF STALL
- CZMAX AUGMENTATION
- TURBULENT
- THEIR ADVANTAGES AND DISADVANTAGES ON PRESSURE DRAG AND FRICTION DRAG
- SPECIAL CIRCUMSTANCES
- ICE AND OTHER CONTAMINATION
- ICE IN STAGNATION POINT
- ICE ON THE SURFACE (FROST, SNOW, CLEAR ICE)
- RAIN
- CONTAMINATION OF THE LEADING EDGE
- EFFECTS ON STALL
- EFFECTS ON LOSS OF CONTROLLABILITY
- EFFECTS ON CONTROL SURFACE MOMENT
- INFLUENCE ON HIGH LIFT DEVICES DURING TAKE OFF, LANDING AND LOW SPEEDS
- EFFECT ON LIFT / DRAG RATIO
- DEFORMATION AND MODIFICATION OF AIRFRAME, AGEING AIRCRAFT

**LECTURE DETAILS**

SUBJECT TITLE: **PRINCIPLES OF FLIGHT**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **4/12**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

TRANSONIC AERODYNAMICS

- THE MACH NUMBER DEFINITION
- SPEED OF SOUND
- INFLUENCE OF TEMPERATURE AND ALTITUDE
- COMPRESSIBILITY
- NORMAL SHOCKWAVES
- MCRIT AND EXCEEDING MCRIT
- INFLUENCE OF: MACH NUMBER CONTROL DEFLECTION ANGLE OF ATTACK AEROFOIL THICKNESS ANGLE OF SWEEP AREA RULING
- AERODYNAMIC HEATING
- SHOCK STALL / MACH BUFFET
- BUFFET MARGIN, AERODYNAMIC CEILING
- VORTEX GENERATORS
- SUPERCRITICAL PROFILE

PROGRESS TEST  
REVIEW OF PROGRESS TEST ANSWERS  
QUESTIONS & ANSWERS ON ALL TOPICS

**LECTURE DETAILS**

SUBJECT TITLE:

**PRINCIPLES OF FLIGHT**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **5/12**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

SUPERSONIC AERODYNAMICS

- OBLIQUE SHOCKWAVES
- MACH CONE
- INFLUENCE OF AIRCRAFT WEIGHT
- EXPANSION WAVES
- CENTER OF PRESSURE
- WAVE DRAG
- CONTROL SURFACE HINGE MOMENT
- CONTROL SURFACE EFFICIENCY

PROGRESS TEST

REVIEW OF PROGRESS TEST ANSWERS  
QUESTIONS & ANSWERS ON ALL TOPICS

**LECTURE DETAILS**

SUBJECT TITLE:

**PRINCIPLES OF FLIGHT**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **6/12**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

STABILITY

- CONDITION OF EQUILIBRIUM IN STABLE HORIZONTAL FLIGHT
- PRECONDITION FOR STATIC STABILITY
- SUM OF MOMENTS
- LIFT AND WEIGHT
- DRAG AND THRUST
- SUM OF FORCES
- IN HORIZONTAL PLANE
- IN VERTICAL PLANE
- METHODS OF ACHIEVING BALANCE
- WING AND EMPENNAGE (TAIL AND CANARD)
- CONTROL SURFACES
- BALLAST OR WEIGHT TRIM
- LONGITUDINAL STABILITY
- BASICS AND DEFINITIONS
- STATIC STABILITY, POSITIVE, NEUTRAL AND NEGATIVE
- PRECONDITION FOR DYNAMIC STABILITY
- DYNAMIC STABILITY, POSITIVE, NEUTRAL AND NEGATIVE
- STATIC STABILITY
- NEUTRAL POINT / LOCATION OF NEUTRAL POINT
- LOCATION OF CENTER OF GRAVITY
- AFT LIMIT, MINIMUM STABILITY MARGIN
- FORWARD POSITION
- EFFECTS ON STATIC AND DYNAMIC STABILITY
- THE CM -  $\alpha$  GRAPH



<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>PRINCIPLES OF FLIGHT</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>7/12</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>STABILITY</p> <ul style="list-style-type: none"> <li>➤ LOCATION OF CENTER OF GRAVITY</li> <li>➤ CONTROL DEFLECTION</li> <li>➤ MAJOR AIRCRAFT PARTS (WINGS, FUSELAGE, TAIL)</li> <li>➤ THE STICK FORCE SPEED GRAPH (IAS)</li> <li>➤ THE MANEUVERING / STICK FORCE PER G</li> <li>➤ STICK FORCE PER G AND THE LIMIT LOAD FACTOR</li> <li>➤ SPECIAL CIRCUMSTANCES</li> <li>➤ STATIC DIRECTIONAL STABILITY</li> <li>➤ SLIP ANGLE <math>\beta</math></li> <li>➤ YAW MOMENT COEFFICIENT <math>C_N</math></li> <li>➤ <math>C_N - \beta</math> GRAPH</li> <li>➤ STATIC LATERAL STABILITY</li> <li>➤ BANK ANGLE <math>\phi</math></li> <li>➤ THE ROLL MOMENT COEFFICIENT <math>C_L</math></li> <li>➤ CONTRIBUTION OF ANGLE OF SLIP <math>\beta</math></li> <li>➤ THE <math>C_L - \beta</math> GRAPH</li> <li>➤ EFFECTIVE LATERAL STABILITY</li> <li>➤ DYNAMIC LATERAL STABILITY</li> <li>➤ EFFECTS OF ASYMMETRIC PROPELLER SLIPSTREAM</li> <li>➤ TENDENCY TO SPIRAL DIVE</li> <li>➤ DUTCH ROLL</li> <li>➤ EFFECTS OF ALTITUDE ON DYNAMIC STABILITY</li> </ul>	

**LECTURE DETAILS**

SUBJECT TITLE:

**PRINCIPLES OF FLIGHT**

DURATION: 5 HOURS

BREAK DURATION:

5 MINS

LECTURE NUMBER:

**8/12**

TOTAL BREAK DURATION:

15 MINS

**CONTENTS & OBJECTIVES**

CONTROL

- GENERAL
- BASICS, THE THREE PLANES AND THREE AXIS
- CAMBER CHANGE
- ANGLE OF ATTACK CHANGE
- PITCH CONTROL
- ELEVATOR
- DOWNWASH EFFECTS
- ICE ON TAIL
- LOCATION OF CENTER OF GRAVITY
- YAW CONTROL
- PEDAL / RUDDER RATIO CHANGER
- MOMENTS DUE TO ENGINE THRUST
- ENGINE FAILURE (N – 1)
- RUDDER LIMITATIONS AT ASYMMETRIC THRUST
- MEANING OF  $V_{MCA}$ ,  $V_{MCG}$
- **ROLL CONTROL**
- AILERONS
- INBOARD AILERONS
- OUTBOARD AILERONS
- FUNCTION IN DIFFERENT PHASES OF FLIGHT
- SPOILERS

**LECTURE DETAILS**

SUBJECT TITLE:

**PRINCIPLES OF FLIGHT**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **9/12**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

CONTROL

- ADVERSE YAW
- MEANS TO AVOID ADVERSE YAW
- INTERACTION IN DIFFERENT PLANES (YAW / ROLL)
- LIMITATIONS OF ASYMMETRIC POWER
- MEANS TO REDUCE CONTROL FORCES
- AERODYNAMIC BALANCE
- ARTIFICIAL
- MASS BALANCE
- REASONS TO BALANCE
- MEANS
- TRIMMING
- REASONS TO TRIM
- TRIM TABS
- STABILIZER TRIM / TRIM RATE VERSUS IAS
- POSITION OF CENTER OF GRAVITY INFLUENCE ON TRIM / STABILIZER SETTING FOR TAKE OFF

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>PRINCIPLES OF FLIGHT</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>10/12</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p><b>LIMITATIONS</b></p> <ul style="list-style-type: none"> <li>➤ OPERATING LIMITATIONS</li> <li>➤ FLUTTER</li> <li>➤ AILERON REVERSAL</li> <li>➤ GEAR /FLAP OPERATING</li> <li>➤ VMO , VNO , VNE MMO</li> <li>➤ MANEUVERING ENVELOPE</li> <li>➤ MANEUVERING LOAD DIAGRAM</li> <li>➤ LOAD FACTOR</li> <li>➤ ACCELERATED STALL SPEED</li> <li>➤ VA , VC , VD</li> <li>➤ MANEUVERING LIMIT LOAD FACTOR / CERTIFICATION CATEGORY</li> <li>➤ CONTRIBUTION OF: MASS, ALTITUDE, MACH NUMBER</li> <li>➤ GUST ENVELOPE</li> <li>➤ GUST LOAD DIAGRAM</li> </ul> <p><b>PROGRESS TEST</b> REVIEW OF PROGRESS TEST ANSWERS QUESTIONS &amp; ANSWERS ON ALL TOPICS</p>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>PRINCIPLES OF FLIGHT</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>11/12</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PROPELLERS</p> <ul style="list-style-type: none"> <li>➤ CONVERSION OF ENGINE TORQUE TO THRUST</li> <li>➤ MEANING OF PITCH</li> <li>➤ BLADE TWIST</li> <li>➤ FIXED PITCH AND VARIABLE PITCH / CONSTANT SPEED</li> <li>➤ PROPELLER EFFICIENCY VERSUS SPEED</li> <li>➤ EFFECTS OFF ICE ON PROPELLER</li> <li>➤ ENGINE FAILURE OR ENGINE STOP</li> <li>➤ WINDMILLING DRAG</li> <li>➤ INFLUENCE ON YAW MOMENT WHEN ASYMMETRIC POWER</li> <li>➤ FEATHERING</li> <li>➤ INFLUENCE ON GLIDE PERFORMANCE</li> <li>➤ INFLUENCE ON YAW MOMENT WHEN ASYMMETRIC POWER</li> <li>➤ DESIGN FEATURE FOR POWER ABSORPTION</li> <li>➤ ASPECT RATIO OF BLADE</li> <li>➤ DIAMETER OF PROPELLER</li> <li>➤ NUMBER OF BLADES</li> <li>➤ PROPELLER NOISE</li> <li>➤ MOMENTS AND COUPLES DUE TO PROPELLER OPERATION</li> <li>➤ TORQUE REACTION</li> <li>➤ GYROSCOPIC PRECESSION</li> <li>➤ ASYMMETRIC SLIPSTREAM EFFECT</li> <li>➤ ASYMMETRIC BLADE EFFECT</li> </ul>	

**LECTURE DETAILS**

SUBJECT TITLE: **PRINCIPLES OF FLIGHT**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **12/12**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

FLIGHT MECHANICS

- FORCES ACTING ON AEROPLANE
- STRAIGHT HORIZONTAL STEADY FLIGHT
- STRAIGHT STEADY CLIMB
- STRAIGHT STEADY DESCEND
- STRAIGHT STEADY GLIDE
- STRAIGHT COORDINATED TURN
- BANK ANGLE
- LOAD FACTOR
- TURN RADIUS
- ASYMMETRIC THRUST
- MOMENTS ABOUT THE VERTICAL AXIS
- FORCES ON VERTICAL FIN
- INFLUENCE ON BANK ANGLE
- INFLUENCE OF AIRCRAFT WEIGHT
- INFLUENCE OF USE OF AILERONS
- INFLUENCE OF ALTITUDE
- EMERGENCY DESCEND
- INFLUENCE OF CONFIGURATION
- INFLUENCE OF CHOSEN MACH NUMBER AND IAS
- TYPICAL POINTS ON POLAR CURVE
- WIND SHEAR

SAMPLE EXAM

REVIEW OF SAMPLE TEST ANSWERS  
QUESTIONS & ANSWERS ON ALL TOPICS

<b>SUBJECT DETAILS</b>	
<b>091</b>	<b>VFR COMMUNICATIONS</b>
INSTRUCTIONAL HOURS:	<b>15</b>
NUMBER OF LECTURES:	<b>3</b>
LECTURE DURATION (without Break):	<b>5</b>
NUMBER OF PROGRESS TESTS (MINIMUM):	<b>1</b>
NUMBER OF SAMPLE EXAMS (MINIMUM):	<b>1</b>
<b>GENERAL DESCRIPTION &amp; OBJECTIVES OF SUBJECT TRAINING</b>	
<ul style="list-style-type: none"> <li>✓ DEFINITIONS</li> <li>✓ GENERAL OPERATING PROCEDURES</li> <li>✓ RELEVANT WEATHER INFORMATION TERMS</li> <li>✓ DISTRESS AND URGENCY PROCEDURES</li> <li>✓ GENERAL PRINCIPLES OF VHF PROPAGATION AND ALLOCATION OF FREQUENCIES</li> </ul>	



**TRAINING MANUAL  
PART 4  
Theoretical Knowledge  
Instruction**

Page: 198  
Revision: 1  
Date: 6 Feb 2009

**INTENTIONALLY LEFT BLANK**



**LECTURE DETAILS**

SUBJECT TITLE:

**VFR COMMUNICATIONS**

DURATION: 5 hours

BREAK DURATION: 5 mins

LECTURE NUMBER: **1/3**

TOTAL BREAK DURATION: 15 mins

**CONTENTS & OBJECTIVES**

DEFINITIONS

- MEANINGS AND SIGNIFICANCE OF ASSOCIATED TERMS
- AIR TRAFFIC CONTROL ABBREVIATIONS
- Q – CODE GROUPS COMMONLY USED IN R / T AIR-GROUND COMMUNICATIONS
- CATEGORIES OF MESSAGES

GENERAL OPERATING PROCEDURES

- TRANSMISSION OF LETTERS
- TRANSMISSION OF NUMBERS (INCLUDING LEVEL INFORMATION)
- TRANSMISSION OF TIME
- TRANSMISSION TECHNIQUE
- STANDARD WORDS AND PHRASES (RELEVANT RT PHRASEOLOGY INCLUDED)
- RADIOTELEPHONY CALL SIGNS FOR AERONAUTICAL STATIONS INCLUDING USE OF ABBREVIATED CALL SIGNS
- RADIOTELEPHONY CALL SIGNS FOR AIRCRAFT INCLUDING USE OF ABBREVIATED

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>VFR COMMUNICATIONS</b>	
DURATION: 5 hours	BREAK DURATION: 5 mins
LECTURE NUMBER: <b>2/3</b>	TOTAL BREAK DURATION: 15 mins
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>GENERAL OPERATING PROCEDURES</p> <ul style="list-style-type: none"> <li>➤ CALL SIGNS</li> <li>➤ TRANSFER OF COMMUNICATION</li> <li>➤ TEST PROCEDURES INCLUDING READABILITY SCALE</li> <li>➤ READ BACK AND ACKNOWLEDGEMENT REQUIREMENTS</li> <li>➤ RADAR PROCEDURAL PHRASEOLOGY</li> </ul> <p>RELEVANT WEATHER INFORMATION TERMS</p> <ul style="list-style-type: none"> <li>➤ AERODROME WEATHER</li> <li>➤ WEATHER FORECAST</li> </ul> <p>PROGRESS TEST REVIEW OF PROGRESS TEST ANSWERS QUESTIONS &amp; ANSWERS ON ALL TOPICS</p>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>VFR COMMUNICATIONS</b>	
DURATION: 5 hours	BREAK DURATION: 5 mins
LECTURE NUMBER: <b>3/3</b>	TOTAL BREAK DURATION: 15 mins
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>DISTRESS AND URGENCY PROCEDURES</p> <ul style="list-style-type: none"> <li>➤ DISTRESS (DEFINITION – FREQUENCIES – WATCH OF DISTRESS FREQUENCIES – SIGNAL – MESSAGE)</li> <li>➤ URGENCY (DEFINITION – FREQUENCIES – SIGNAL – MESSAGE)</li> </ul> <p>GENERAL PRINCIPLES OF VHF PROPAGATION AND ALLOCATION OF FREQUENCIES</p> <p>SAMPLE EXAM REVIEW OF SAMPLE TEST ANSWERS QUESTIONS &amp; ANSWERS ON ALL TOPICS</p>	



**TRAINING MANUAL  
PART 4  
Theoretical Knowledge  
Instruction**

Page: 202  
Revision: 1  
Date: 6 Feb 2009

**INTENTIONALLY LEFT BLANK**

<b>SUBJECT DETAILS</b>	
<b>092</b>	<b>IFR COMMUNICATIONS</b>
INSTRUCTIONAL HOURS:	<b>15</b>
NUMBER OF LECTURES:	<b>3</b>
LECTURE DURATION (WITHOUT BREAK):	<b>5</b>
NUMBER OF PROGRESS TESTS (MINIMUM):	<b>1</b>
NUMBER OF SAMPLE EXAMS (MINIMUM):	<b>1</b>
<b>GENERAL DESCRIPTION &amp; OBJECTIVES OF SUBJECT TRAINING</b>	
<ul style="list-style-type: none"><li>✓ DEFINITIONS</li><li>✓ GENERAL OPERATING PROCEDURES</li><li>✓ DISTRESS AND URGENCY PROCEDURES</li><li>✓ RELEVANT WEATHER INFORMATION TERMS</li><li>✓ MORSE CODE</li></ul>	



**TRAINING MANUAL  
PART 4  
Theoretical Knowledge  
Instruction**

Page: 204  
Revision: 1  
Date: 6 Feb 2009

**INTENTIONALLY LEFT BLANK**

**LECTURE DETAILS**

SUBJECT TITLE:

**IFR COMMUNICATIONS**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **1/3**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

DEFINITIONS

- MEANING AND SIGNIFICANCE OF ASSOCIATED TERMS
- AIR TRAFFIC CONTROL ABBREVIATIONS

GENERAL OPERATING PROCEDURES

- STANDARD WORDS AND PHRASES (RELEVANT RT PHRASEOLOGY)
- RADIOTELEPHONY CALL SIGNS FOR AERONAUTICAL STATIONS INCLUDING USE OF ABBREVIATED CALL SIGNS
- RADIOTELEPHONY CALL SIGNS INCLUDING USE OF ABBREVIATED CALL SIGNS
- READ BACK AND ACKNOWLEDGEMENT REQUIREMENTS
- LEVEL CHANGES AND REPORTS

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>IFR COMMUNICATIONS</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>2/3</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>DISTRESS AND URGENCY PROCEDURES</p> <ul style="list-style-type: none"> <li>➤ PAN MEDICAL</li> <li>➤ DISTRESS (DEFINITION – FREQUENCIES – WATCH OF DISTRESS FREQUENCIES – SIGNAL – MESSAGE)</li> <li>➤ URGENCY (DEFINITION – FREQUENCIES – SIGNAL – MESSAGE)</li> </ul> <p>PROGRESS TEST REVIEW OF PROGRESS TEST ANSWERS QUESTIONS &amp; ANSWERS ON ALL TOPICS</p>	



**LECTURE DETAILS**

SUBJECT TITLE: **IFR COMMUNICATIONS**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **3/3**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

RELEVANT WEATHER INFORMATION TERMS

- AERODROME WEATHER
- WEATHER BROADCAST

MORSE CODE

SAMPLE EXAM

REVIEW OF SAMPLE TEST ANSWERS  
QUESTIONS & ANSWERS ON ALL TOPICS



**TRAINING MANUAL  
PART 4  
Theoretical Knowledge  
Instruction**

Page: 208  
Revision: 1  
Date: 6 Feb 2009

## **APPENDIX 2**

<b>Ground School Subject</b>	
010	AIR LAW
020	AIRCRAFT GENERAL KNOWLEDGE
030	FLIGHT PERFORMANCE AND PLANNING
040	HUMAN PERFORMANCE AND LIMITATIONS
050	METEOROLOGY
060	NAVIGATION
070	OPERATIONAL PROCEDURES
081	PRINCIPLES OF FLIGHT
090	COMMUNICATIONS



**TRAINING MANUAL  
PART 4  
Theoretical Knowledge  
Instruction**

Page: 210  
Revision: 1  
Date: 6 Feb 2009

<b>PPL (A) SUBJECT DETAILS</b>	
<b>010</b>	<b>AIR LAW</b>
INSTRUCTIONAL HOURS:	<b>5</b>
NUMBER OF LECTURES:	<b>2</b>
LECTURE DURATION (WITHOUT BREAK):	<b>2,5</b>
NUMBER OF SAMPLE EXAMS (MINIMUM):	<b>1</b>
<b>GENERAL DESCRIPTION &amp; OBJECTIVES OF SUBJECT TRAINING</b>	
<ul style="list-style-type: none"> <li>✓ LEGISLATION</li> <li>✓ RULES OF THE AIR</li> <li>✓ DIVISION OF AIRSPACE AND AIR TRAFFIC SERVICES</li> <li>✓ RULES OF THE AIR AND AIR TRAFFIC SERVICES</li> <li>✓ AIRCRAFT REGISTRATION</li> <li>✓ AIRWORTHINESS OF AIRCRAFT</li> <li>✓ JAA REGULATIONS</li> </ul>	



**TRAINING MANUAL  
PART 4  
Theoretical Knowledge  
Instruction**

Page: 212  
Revision: 1  
Date: 6 Feb 2009

**INTENTIONALLY LEFT BLANK**

### LECTURE DETAILS

SUBJECT TITLE:	<b>AIR LAW</b>		
DURATION:	2,5 HOURS	BREAK DURATION:	5 MINS
LECTURE NUMBER:	<b>1/2</b>	TOTAL BREAK DURATION:	10 MINS

### CONTENTS & OBJECTIVES

- LEGISLATION
- RULES OF THE AIR
- DIVISION OF AIRSPACE AND AIR TRAFFIC SERVICES
- RULES OF THE AIR AND AIR TRAFFIC SERVICES
- AIRCRAFT REGISTRATION
- AIRWORTHINESS OF AIRCRAFT
- JAA REGULATIONS
- REVIEW & EVALUATION

**LECTURE DETAILS**

SUBJECT TITLE:

**AIR LAW**

DURATION: 2,5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **2/2**

TOTAL BREAK DURATION: 10 MINS

**CONTENTS & OBJECTIVES**

- REVISION OF SUBJECTS
- REVIEW & EVALUATION
- PPL QUESTIONNAIRES PRESENTATION
- PPL QUESTIONNAIRES REVIEW



<b>PPL (A) SUBJECT DETAILS</b>	
<b>020</b>	<b>AIRCRAFT GENERAL KNOWLEDGE</b>
INSTRUCTIONAL HOURS:	<b>10</b>
NUMBER OF LECTURES:	<b>4</b>
LECTURE DURATION (WITHOUT BREAK):	<b>2,5</b>
NUMBER OF SAMPLE EXAMS (MINIMUM):	<b>1</b>
<b>GENERAL DESCRIPTION &amp; OBJECTIVES OF SUBJECT TRAINING</b>	
<ul style="list-style-type: none"> <li>➤ THE AIRFRAME</li> <li>➤ AERO ENGINES</li> <li>➤ THE FUEL SYSTEM</li> <li>➤ THE INDUCTION SYSTEM</li> <li>➤ THE IGNITION SYSTEM</li> <li>➤ THE COOLING SYSTEM</li> <li>➤ THE OIL SYSTEM</li> <li>➤ THE PROPELLER</li> <li>➤ ENGINE HANDLING</li> <li>➤ AIRCRAFT SYSTEMS</li> <li>➤ INSTRUMENTS</li> <li>➤ AIRWORTHINESS</li> <li>➤ AEROPLANE FLIGHT SAFETY</li> <li>➤ OPERATIONAL FLIGHT SAFETY</li> </ul>	



**TRAINING MANUAL  
PART 4  
Theoretical Knowledge  
Instruction**

Page: 216  
Revision: 1  
Date: 6 Feb 2009

**INTENTIONALLY LEFT BLANK**

### LECTURE DETAILS

SUBJECT TITLE:

**AIRCRAFT GENERAL KNOWLEDGE**

DURATION: 2,5 HOURS

BREAK DURATION:

5 MINS

LECTURE NUMBER:

**1/4**

TOTAL BREAK DURATION:

10 MINS

### CONTENTS & OBJECTIVES

- THE AIRFRAME
- AERO ENGINES
- THE FUEL SYSTEM

**LECTURE DETAILS**

SUBJECT TITLE: **AIRCRAFT GENERAL KNOWLEDGE**

DURATION: 2,5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **2/4**

TOTAL BREAK DURATION: 10 MINS

**CONTENTS & OBJECTIVES**

- THE INDUCTION SYSTEM
- THE IGNITION SYSTEM
- THE COOLING SYSTEM
- THE OIL SYSTEM
- THE PROPELLER
- REVISION OF SUBJECTS
- REVIEW & EVALUATION

**LECTURE DETAILS**

SUBJECT TITLE: **AIRCRAFT GENERAL KNOWLEDGE**

DURATION: 2,5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **3/4**

TOTAL BREAK DURATION: 10 MINS

**CONTENTS & OBJECTIVES**

- ENGINE HANDLING
- AIRCRAFT SYSTEMS
- INSTRUMENTS
- AIRWORTHINESS
- AEROPLANE FLIGHT SAFETY
- OPERATIONAL FLIGHT SAFETY
- REVISION OF SUBJECTS
- REVIEW & EVALUATION

**LECTURE DETAILS**

SUBJECT TITLE: **AIRCRAFT GENERAL KNOWLEDGE**

DURATION: 2,5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **4/4**

TOTAL BREAK DURATION: 10 MINS

**CONTENTS & OBJECTIVES**

- REVISION OF SUBJECTS
- REVIEW & EVALUATION
  
- PPL QUESTIONNAIRES PRESENTATION
- PPL QUESTIONNAIRES REVIEW

<b>PPL (A) SUBJECT DETAILS</b>	
<b>030</b>	<b>FLIGHT PERFORMANCE AND PLANNING</b>
INSTRUCTIONAL HOURS:	<b>10</b>
NUMBER OF LECTURES:	<b>4</b>
LECTURE DURATION (WITHOUT BREAK):	<b>2,5</b>
NUMBER OF SAMPLE EXAMS (MINIMUM):	<b>1</b>
<b>GENERAL DESCRIPTION &amp; OBJECTIVES OF SUBJECT TRAINING</b>	
<ul style="list-style-type: none"><li>➤ MASS AND BALANCE</li><li>➤ TAKE-OFF AND CLIMB</li><li>➤ MASS AND BALANCE</li><li>➤ TAKE-OFF AND CLIMB</li><li>➤ IN-FLIGHT PERFORMANCE</li><li>➤ DESCENT AND LANDING PERFORMANCE</li><li>➤ RUNWAY DIMENSIONS</li></ul>	



**TRAINING MANUAL  
PART 4  
Theoretical Knowledge  
Instruction**

Page: 222  
Revision: 1  
Date: 6 Feb 2009

**INTENTIONALLY LEFT BLANK**



### LECTURE DETAILS

SUBJECT TITLE:

**FLIGHT PERFORMANCE AND PLANNING**

DURATION: 2,5 HOURS

BREAK DURATION:

5 MINS

LECTURE NUMBER:

**1/4**

TOTAL BREAK DURATION:

10 MINS

### CONTENTS & OBJECTIVES

- MASS AND BALANCE
- TAKE-OFF AND CLIMB
- EXERCISES
- REVIEW & EVALUATION

**LECTURE DETAILS**

SUBJECT TITLE: **FLIGHT PERFORMANCE AND PLANNING**

DURATION: 2,5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **2/4**

TOTAL BREAK DURATION: 10 MINS

**CONTENTS & OBJECTIVES**

- MASS AND BALANCE
- TAKE-OFF AND CLIMB
- EXERCISES
- REVISION OF SUBJECTS
- REVIEW & EVALUATION

**LECTURE DETAILS**

SUBJECT TITLE: **FLIGHT PERFORMANCE AND PLANNING**

DURATION: 2,5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **3/4**

TOTAL BREAK DURATION: 10 MINS

**CONTENTS & OBJECTIVES**

- IN-FLIGHT PERFORMANCE
- DESCENT AND LANDING PERFORMANCE
- RUNWAY DIMENSIONS
- REVISION OF SUBJECTS
- REVIEW & EVALUATION

**LECTURE DETAILS**

SUBJECT TITLE: **FLIGHT PERFORMANCE AND PLANNING**

DURATION: 2,5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **4/4**

TOTAL BREAK DURATION: 10 MINS

**CONTENTS & OBJECTIVES**

- REVISION OF SUBJECTS
- REVIEW & EVALUATION
- PPL QUESTIONNAIRES PRESENTATION
- PPL QUESTIONNAIRES REVIEW

<b>PPL (A) SUBJECT DETAILS</b>	
<b>040</b>	<b>HUMAN PERFORMANCE AND LIMITATIONS</b>
INSTRUCTIONAL HOURS:	<b>5</b>
NUMBER OF LECTURES:	<b>2</b>
LECTURE DURATION (WITHOUT BREAK):	<b>2,5</b>
NUMBER OF SAMPLE EXAMS (MINIMUM):	<b>1</b>
<b>GENERAL DESCRIPTION &amp; OBJECTIVES OF SUBJECT TRAINING</b>	
<ul style="list-style-type: none"><li>➤ THE FUNCTIONS OF THE BODY</li><li>➤ HEALTH AND FLYING</li><li>➤ THE FUNCTIONS OF THE MIND</li><li>➤ STRESS AND MANAGING STRESS</li><li>➤ PERSONALITIES AND COCKPIT RESOURCE MANAGEMENT</li><li>➤ COCKPIT DESIGN AND PROCEDURES</li><li>➤ SAFETY AND SURVIVAL EQUIPMENT</li></ul>	



**TRAINING MANUAL  
PART 4  
Theoretical Knowledge  
Instruction**

Page: 228  
Revision: 1  
Date: 6 Feb 2009

**INTENTIONALLY LEFT BLANK**

### LECTURE DETAILS

SUBJECT TITLE:

**HUMAN PERFORMANCE AND LIMITATIONS**

DURATION: 2,5 HOURS

BREAK DURATION:

5 MINS

LECTURE NUMBER:

**1/2**

TOTAL BREAK DURATION:

10 MINS

### CONTENTS & OBJECTIVES

- THE FUNCTIONS OF THE BODY
- HEALTH AND FLYING
- THE FUNCTIONS OF THE MIND
- STRESS AND MANAGING STRESS
- PERSONALITIES AND COCKPIT RESOURCE MANAGEMENT
- COCKPIT DESIGN AND PROCEDURES
- SAFETY AND SURVIVAL EQUIPMENT

**LECTURE DETAILS**

SUBJECT TITLE: **HUMAN PERFORMANCE AND LIMITATIONS**

DURATION: 2,5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **2/2**

TOTAL BREAK DURATION: 10 MINS

**CONTENTS & OBJECTIVES**

- REVISION OF SUBJECTS
- REVIEW & EVALUATION
- PPL QUESTIONNAIRES PRESENTATION
- PPL QUESTIONNAIRES REVIEW



<b>PPL (A) SUBJECT DETAILS</b>	
<b>050</b>	<b>METEOROLOGY</b>
INSTRUCTIONAL HOURS:	<b>10</b>
NUMBER OF LECTURES:	<b>4</b>
LECTURE DURATION (WITHOUT BREAK):	<b>2,5</b>
NUMBER OF SAMPLE EXAMS (MINIMUM):	<b>1</b>
<b>GENERAL DESCRIPTION &amp; OBJECTIVES OF SUBJECT TRAINING</b>	
<ul style="list-style-type: none"> <li>➤ PROPERTIES OF THE ATMOSPHERE</li> <li>➤ THE MOTION OF THE ATMOSPHERE</li> <li>➤ PRESSURE AND ALTIMETRY</li> <li>➤ HUMIDITY AND STABILITY</li> <li>➤ THE INTERNATIONAL STANDARD ATMOSPHERE</li> <li>➤ CLOUDS AND PRECIPITATION</li> <li>➤ VISIBILITY</li> <li>➤ AIR MASSES</li> <li>➤ LOW PRESSURE SYSTEMS – DEPRESSIONS</li> <li>➤ HIGH PRESSURE SYSTEMS – ANTICYCLONES AND RIDGES</li> <li>➤ ICING</li> <li>➤ THUNDERSTORMS</li> <li>➤ FLIGHT OVER MOUNTAINOUS AREAS AND OTHER WEATHER HAZARD</li> <li>➤ CLIMATOLOGY</li> <li>➤ AVIATION WEATHER REPORTS AND FORECASTS</li> </ul>	



**TRAINING MANUAL  
PART 4  
Theoretical Knowledge  
Instruction**

Page: 232  
Revision: 1  
Date: 6 Feb 2009

**INTENTIONALLY LEFT BLANK**

### LECTURE DETAILS

SUBJECT TITLE:	<b>METEOROLOGY</b>		
DURATION:	2,5 HOURS	BREAK DURATION:	5 MINS
LECTURE NUMBER:	<b>1/4</b>	TOTAL BREAK DURATION:	10 MINS

### CONTENTS & OBJECTIVES

- PROPERTIES OF THE ATMOSPHERE
- THE MOTION OF THE ATMOSPHERE
- PRESSURE AND ALTIMETRY
- HUMIDITY AND STABILITY
- THE INTERNATIONAL STANDARD ATMOSPHERE
- CLOUDS AND PRECIPITATION
- VISIBILITY
- AIR MASSES

**LECTURE DETAILS**

SUBJECT TITLE:

**METEOROLOGY**

DURATION: 2,5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **2/4**

TOTAL BREAK DURATION: 10 MINS

**CONTENTS & OBJECTIVES**

- LOW PRESSURE SYSTEMS – DEPRESSIONS
- HIGH PRESSURE SYSTEMS – ANTICYCLONES AND RIDGES
- ICING
- THUNDERSTORMS

**LECTURE DETAILS**

SUBJECT TITLE:

**METEOROLOGY**

DURATION: 2,5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **3/4**

TOTAL BREAK DURATION: 10 MINS

**CONTENTS & OBJECTIVES**

- FLIGHT OVER MOUNTAINOUS AREAS AND OTHER WEATHER HAZARD
- CLIMATOLOGY
- AVIATION WEATHER REPORTS AND FORECASTS

**LECTURE DETAILS**

SUBJECT TITLE:

**METEOROLOGY**

DURATION: 2,5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **4/4**

TOTAL BREAK DURATION: 10 MINS

**CONTENTS & OBJECTIVES**

- REVISION OF SUBJECTS
- REVIEW & EVALUATION
  
- PPL QUESTIONNAIRES PRESENTATION
- PPL QUESTIONNAIRES REVIEW

<b>PPL (A) SUBJECT DETAILS</b>	
<b>060</b>	<b>NAVIGATION</b>
INSTRUCTIONAL HOURS:	<b>20</b>
NUMBER OF LECTURES:	<b>8</b>
LECTURE DURATION (WITHOUT BREAK):	<b>2,5</b>
NUMBER OF SAMPLE EXAMS (MINIMUM):	<b>1</b>
<b>GENERAL DESCRIPTION &amp; OBJECTIVES OF SUBJECT TRAINING</b>	
<ul style="list-style-type: none"> <li>➤ THE EARTH</li> <li>➤ AERONAUTICAL MAPS</li> <li>➤ NAVIGATION PRINCIPLES: THE TRIANGLE OF VELOCITIES</li> <li>➤ NAVIGATION PRINCIPLES: AIRSPEED. GROUND SPEED, TIME AND DISTANCE</li> <li>➤ VERTICAL NAVIGATION</li> <li>➤ AIRCRAFT MAGNETISM</li> <li>➤ PRACTICAL NAVIGATION: DEAD RECKONING AND MAP READING</li> <li>➤ PRACTICAL NAVIGATION: DEPARTURE, EN-ROUTE, AND ARRIVAL PROCEDURES</li> <li>➤ PRACTICAL NAVIGATION: OFF-TRACK CALCULATIONS AND TRACK MARKING</li> <li>➤ PRACTICAL NAVIGATION: DIVERSION PROCEDURE</li> <li>➤ PRACTICAL NAVIGATION: LOST PROCEDURE</li> <li>➤ SPECIAL NAVIGATION SITUATIONS</li> <li>➤ FLIGHT PLANNING: FUEL PLANNING</li> <li>➤ FLIGHT PLANNING: PERFORMANCE</li> <li>➤ FLIGHT PLANNING: THE AERONAUTICAL INFORMATION SERVICE</li> <li>➤ FLIGHT PLANNING: THE FULL FLIGHT PLAN</li> <li>➤ FLIGHT PLANNING: TIME</li> <li>➤ FLIGHT PLANNING: SUMMARY</li> <li>➤ RADIO NAVIGATION</li> </ul>	



**TRAINING MANUAL  
PART 4  
Theoretical Knowledge  
Instruction**

Page: 238  
Revision: 1  
Date: 6 Feb 2009

**INTENTIONALLY LEFT BLANK**



### LECTURE DETAILS

SUBJECT TITLE:

**NAVIGATION**

DURATION: 2,5 HOURS

BREAK DURATION:

5 MINS

LECTURE NUMBER:

**1/8**

TOTAL BREAK DURATION:

10 MINS

### CONTENTS & OBJECTIVES

- THE EARTH
- AERONAUTICAL MAPS
- NAVIGATION PRINCIPLES: THE TRIANGLE OF VELOCITIES
- NAVIGATION PRINCIPLES: AIRSPEED, GROUND SPEED, TIME AND DISTANCE

**LECTURE DETAILS**

SUBJECT TITLE:

**NAVIGATION**

DURATION: 2,5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **2/8**

TOTAL BREAK DURATION: 10 MINS

**CONTENTS & OBJECTIVES**

- VERTICAL NAVIGATION
- AIRCRAFT MAGNETISM
- REVISION OF SUBJECTS
- REVIEW & EVALUATION

<b>LECTURE DETAILS</b>			
SUBJECT TITLE:		<b>NAVIGATION</b>	
DURATION:	2,5 HOURS	BREAK DURATION:	5 MINS
LECTURE NUMBER:	<b>3/8</b>	TOTAL BREAK DURATION:	10 MINS
<b>CONTENTS &amp; OBJECTIVES</b>			
<ul style="list-style-type: none"> <li>➤ PRACTICAL NAVIGATION: DEAD RECKONING AND MAP READING</li> <li>➤ PRACTICAL NAVIGATION: DEPARTURE, EN-ROUTE, AND ARRIVAL PROCEDURES</li> <li>➤ PRACTICAL NAVIGATION: OFF-TRACK CALCULATIONS AND TRACK MARKING</li> <li>➤ REVISION OF SUBJECTS</li> <li>➤ REVIEW &amp; EVALUATION</li> </ul>			

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>NAVIGATION</b>	
DURATION: 2,5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>4/8</b>	TOTAL BREAK DURATION: 10 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<ul style="list-style-type: none"> <li>➤ PRACTICAL NAVIGATION: DIVERSION PROCEDURE</li> <li>➤ PRACTICAL NAVIGATION: LOST PROCEDURE</li> <li>➤ SPECIAL NAVIGATION SITUATIONS</li> <li>➤ REVISION OF SUBJECTS</li> <li>➤ REVIEW &amp; EVALUATION</li> </ul>	

**LECTURE DETAILS**

SUBJECT TITLE:

**NAVIGATION**

DURATION: 2,5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **5/8**

TOTAL BREAK DURATION: 10 MINS

**CONTENTS & OBJECTIVES**

- FLIGHT PLANNING: FUEL PLANNING
- FLIGHT PLANNING: PERFORMANCE
- REVISION OF SUBJECTS
- REVIEW & EVALUATION

**LECTURE DETAILS**

SUBJECT TITLE:

**NAVIGATION**

DURATION: 2,5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **6/8**

TOTAL BREAK DURATION: 10 MINS

**CONTENTS & OBJECTIVES**

- FLIGHT PLANNING: THE AERONAUTICAL INFORMATION SERVICE
- FLIGHT PLANNING: THE FULL FLIGHT PLAN
- REVISION OF SUBJECTS
- REVIEW & EVALUATION

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>NAVIGATION</b>	
DURATION: 2,5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>7/8</b>	TOTAL BREAK DURATION: 10 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<ul style="list-style-type: none"> <li>➤ FLIGHT PLANNING: TIME</li> <li>➤ FLIGHT PLANNING: SUMMARY</li> <li>➤ RADIO NAVIGATION</li> <li>➤ REVISION OF SUBJECTS</li> <li>➤ REVIEW &amp; EVALUATION</li> </ul>	

**LECTURE DETAILS**

SUBJECT TITLE:

**NAVIGATION**

DURATION: 2,5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **8/8**

TOTAL BREAK DURATION: 10 MINS

**CONTENTS & OBJECTIVES**

- REVISION OF SUBJECTS
- REVIEW & EVALUATION
- PPL QUESTIONNAIRES PRESENTATION
- PPL QUESTIONNAIRES REVIEW



**PPL (A) SUBJECT DETAILS**

**070**

**OPERATIONAL PROCEDURES**

INSTRUCTIONAL HOURS: **5**

NUMBER OF LECTURES: **2**

LECTURE DURATION (WITHOUT BREAK): **2,5**

NUMBER OF SAMPLE EXAMS (MINIMUM): **1**

**GENERAL DESCRIPTION &  
OBJECTIVES OF SUBJECT TRAINING**

- OPERATION OF AIRCRAFT
- SEARCH AND RESCUE
- ACCIDENT AND INCIDENT INVESTIGATION
- NOISE ABATEMENT PROCEDURES
- CONTRAVENTION OF REGULATIONS



**TRAINING MANUAL  
PART 4  
Theoretical Knowledge  
Instruction**

Page: 248  
Revision: 1  
Date: 6 Feb 2009

**INTENTIONALLY LEFT BLANK**

### LECTURE DETAILS

SUBJECT TITLE:

**OPERATIONAL PROCEDURES**

DURATION: 2,5 HOURS

BREAK DURATION:

5 MINS

LECTURE NUMBER:

**1/2**

TOTAL BREAK DURATION:

10 MINS

### CONTENTS & OBJECTIVES

- OPERATION OF AIRCRAFT
- SEARCH AND RESCUE
- ACCIDENT AND INCIDENT INVESTIGATION
- NOISE ABATEMENT PROCEDURES
- CONTRAVENTION OF REGULATIONS
- REVIEW & EVALUATION

**LECTURE DETAILS**

SUBJECT TITLE: **OPERATIONAL PROCEDURES**

DURATION: 2,5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **2/2**

TOTAL BREAK DURATION: 10 MINS

**CONTENTS & OBJECTIVES**

- REVISION OF SUBJECTS
- REVIEW & EVALUATION
- PPL QUESTIONNAIRES PRESENTATION
- PPL QUESTIONNAIRES REVIEW

<b>PPL (A) SUBJECT DETAILS</b>	
<b>081</b>	<b>PRINCIPLES OF FLIGHT</b>
INSTRUCTIONAL HOURS:	<b>10</b>
NUMBER OF LECTURES:	<b>4</b>
LECTURE DURATION (WITHOUT BREAK):	<b>2,5</b>
NUMBER OF SAMPLE EXAMS (MINIMUM):	<b>1</b>
<b>GENERAL DESCRIPTION &amp; OBJECTIVES OF SUBJECT TRAINING</b>	
<ul style="list-style-type: none"> <li>➤ THE ATMOSPHERE AND PROPERTIES OF THE AIR</li> <li>➤ THE 4 FORCES</li> <li>➤ STABILITY AND CONTROL</li> <li>➤ TRIMMING CONTROLS</li> <li>➤ FLAPS AND SLATS</li> <li>➤ THE STALL</li> <li>➤ AVOIDANCE OF SPINS</li> <li>➤ LOAD FACTOR AND MANOEUVRING FLIGHT</li> </ul>	



**TRAINING MANUAL  
PART 4  
Theoretical Knowledge  
Instruction**

Page: 252  
Revision: 1  
Date: 6 Feb 2009

**INTENTIONALLY LEFT BLANK**

### LECTURE DETAILS

SUBJECT TITLE:

**PRINCIPLES OF FLIGHT**

DURATION: 2,5 HOURS

BREAK DURATION:

5 MINS

LECTURE NUMBER:

**1/4**

TOTAL BREAK DURATION:

10 MINS

### CONTENTS & OBJECTIVES

- THE ATMOSPHERE AND PROPERTIES OF THE AIR
- THE 4 FORCES
- REVIEW & EVALUATION

**LECTURE DETAILS**

SUBJECT TITLE: **PRINCIPLES OF FLIGHT**

DURATION: 2,5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **2/4**

TOTAL BREAK DURATION: 10 MINS

**CONTENTS & OBJECTIVES**

- STABILITY AND CONTROL
- TRIMMING CONTROLS
- FLAPS AND SLATS
- REVISION OF SUBJECTS
- REVIEW & EVALUATION



**LECTURE DETAILS**

SUBJECT TITLE:

**PRINCIPLES OF FLIGHT**

DURATION: 2,5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **3/4**

TOTAL BREAK DURATION: 10 MINS

**CONTENTS & OBJECTIVES**

- THE STALL
- AVOIDANCE OF SPINS
- LOAD FACTOR AND MANOEUVRING FLIGHT
- REVISION OF SUBJECTS
- REVIEW & EVALUATION

**LECTURE DETAILS**

SUBJECT TITLE:

**PRINCIPLES OF FLIGHT**

DURATION: 2,5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **4/4**

TOTAL BREAK DURATION: 10 MINS

**CONTENTS & OBJECTIVES**

- REVISION OF SUBJECTS
- REVIEW & EVALUATION
- PPL QUESTIONNAIRES PRESENTATION
- PPL QUESTIONNAIRES REVIEW

<b>PPL (A) SUBJECT DETAILS</b>	
<b>090</b>	<b>COMMUNICATIONS</b>
INSTRUCTIONAL HOURS:	<b>5</b>
NUMBER OF LECTURES:	<b>2</b>
LECTURE DURATION (WITHOUT BREAK):	<b>2,5</b>
NUMBER OF SAMPLE EXAMS (MINIMUM):	<b>1</b>
<b>GENERAL DESCRIPTION &amp; OBJECTIVES OF SUBJECT TRAINING</b>	
<ul style="list-style-type: none"> <li>➤ PRE-FLIGHT</li> <li>➤ GENERAL OPERATING PROCEDURES</li> <li>➤ AIR TRAFFIC SERVICE UNITS</li> <li>➤ CALL SIGNS, ABBREVIATIONS, GENERAL PROCEDURES</li> <li>➤ DEPARTURE PROCEDURES</li> <li>➤ EN-ROUTE PROCEDURES</li> <li>➤ ARRIVAL / TRAFFIC PATTERN PROCEDURES</li> <li>➤ COMMUNICATION FAILURE</li> <li>➤ EMERGENCY PROCEDURES</li> </ul>	



**TRAINING MANUAL  
PART 4  
Theoretical Knowledge  
Instruction**

Page: 258  
Revision: 1  
Date: 6 Feb 2009

**INTENTIONALLY LEFT BLANK**

### LECTURE DETAILS

SUBJECT TITLE:

**COMMUNICATIONS**

DURATION: 2,5 HOURS

BREAK DURATION:

5 MINS

LECTURE NUMBER:

**1/2**

TOTAL BREAK DURATION:

10 MINS

### CONTENTS & OBJECTIVES

- PRE-FLIGHT
- GENERAL OPERATING PROCEDURES
- AIR TRAFFIC SERVICE UNITS
- CALL SIGNS, ABBREVIATIONS, GENERAL PROCEDURES
- DEPARTURE PROCEDURES
- EN-ROUTE PROCEDURES
- ARRIVAL / TRAFFIC PATTERN PROCEDURES
- COMMUNICATION FAILURE
- EMERGENCY PROCEDURES

**LECTURE DETAILS**

SUBJECT TITLE:

**COMMUNICATIONS**

DURATION: 2,5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **2/2**

TOTAL BREAK DURATION: 10 MINS

**CONTENTS & OBJECTIVES**

- REVISION OF SUBJECTS
- REVIEW & EVALUATION
- PPL QUESTIONNAIRES PRESENTATION
- PPL QUESTIONNAIRES REVIEW

### **APPENDIX 3**

#### **SUBJECT DETAILS**

#### **MULTI ENGINE PISTON CLASS RATING INITIAL TRAINING**

INSTRUCTIONAL HOURS: **10**

NUMBER OF LECTURES: **2**

LECTURE DURATION (WITHOUT BREAK): **5**

NUMBER OF SAMPLE EXAMS (MINIMUM): **1**

#### **GENERAL DESCRIPTION & OBJECTIVES OF SUBJECT TRAINING**

- PRINCIPLES OF FLIGHT-THE PROBLEMS
- CONTROL IN ASYMMETRIC POWER FLIGHT
- MINIMUM CONTROL AND SAFETY SPEEDS
- AEROPLANE PERFORMANCE - ONE ENGINE INOPERATIVE
- AIRCRAFT FAMILIARIZATION
- EMERGENCY DRILLS
- PRE-FLIGHT PREPARATION AND AEROPLANE INSPECTION
- ENGINE STARTING PROCEDURES
- PREPARATION FOR AND ACTION AFTER FLIGHT



**TRAINING MANUAL  
PART 4  
Theoretical Knowledge  
Instruction**

Page: 262  
Revision: 1  
Date: 6 Feb 2009

**INTENTIONALLY LEFT BLANK**



<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>MULTI ENGINE PISTON CLASS RATING INITIAL TRAINING</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>1/2</b>	TOTAL BREAK DURATION: 10 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<ul style="list-style-type: none"> <li>➤ PRINCIPLES OF FLIGHT-THE PROBLEMS</li> <li>➤ CONTROL IN ASYMMETRIC POWER FLIGHT</li> <li>➤ MINIMUM CONTROL AND SAFETY SPEEDS</li> <li>➤ AEROPLANE PERFORMANCE - ONE ENGINE INOPERATIVE</li> </ul> <p>DURING THIS LESSON THE INSTRUCTOR WILL BRIEF THE STUDENTS ON MULTI-ENGINE AERODYNAMICS, OPERATING PROCEDURES, SYSTEMS, AND PERFORMANCE CONSIDERATIONS. THE APPLICANTS WILL LEARN TO ACCURATELY USE PERFORMANCE CHARTS AND COMPUTE WEIGHT AND BALANCE DATA TO CONTROL THE WEIGHT AND BALANCE CONDITIONS OF THE MULTI-ENGINE AIRPLANE. IN ADDITION THE STUDENTS WILL LEARN PRINCIPLES, TECHNIQUES, AND PROCEDURES WHICH APPLY TO ENGINE-OUT AND INSTRUMENT FLIGHT IN THE MULTI-ENGINE AIRPLANE.</p> <ul style="list-style-type: none"> <li>➤ MULTIENGINE PERFORMANCE CHARACTERISTICS</li> <li>➤ THE CRITICAL ENGINE</li> <li>➤ VMC FOR CERTIFICATION</li> <li>➤ PERFORMANCE</li> <li>➤ FACTORS IN TAKEOFF PLANNING</li> <li>➤ ACCELERATE/STOP DISTANCE</li> <li>➤ PROPELLER FEATHERING</li> <li>➤ USE OF TRIM TABS</li> <li>➤ PRE-FLIGHT PREPARATION</li> <li>➤ CHECKLIST</li> <li>➤ TAXIING</li> <li>➤ NORMAL TAKEOFFS</li> <li>➤ REVIEW &amp; EVALUATION</li> </ul>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>MULTI ENGINE PISTON CLASS RATING INITIAL TRAINING</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>2/2</b>	TOTAL BREAK DURATION: 10 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<ul style="list-style-type: none"> <li>➤ AIRCRAFT FAMILIARIZATION</li> <li>➤ EMERGENCY DRILLS</li> <li>➤ PRE-FLIGHT PREPARATION AND AEROPLANE INSPECTION</li> <li>➤ ENGINE STARTING PROCEDURES</li> <li>➤ PREPARATION FOR AND ACTION AFTER FLIGHT</li> </ul> <p>TO FAMILIARIZE THE STUDENT WITH THE TRAINING AIRCRAFT, AND POST FLIGHT REQUIREMENTS INCLUDING LOGBOOK MAINTENANCE. ALSO TO FAMILIARIZE THE STUDENT WITH THE USE OF THE EMERGENCY CHECKLIST AND THE EMERGENCY EXITS AND EQUIPMENT ON BOARD THE AIRCRAFT. REVIEW THE PRINCIPLES OF ASYMMETRIC FLIGHT AND ACTIONS FOLLOWING AN ENGINE FAILURE.</p> <ul style="list-style-type: none"> <li>➤ CROSSWIND TAKEOFFS</li> <li>➤ SHORT-FIELD OR OBSTACLE CLEARANCE TAKEOFF</li> <li>➤ STALLS</li> <li>➤ EMERGENCY DESCENT</li> <li>➤ APPROACHES AND LANDINGS</li> <li>➤ CROSSWIND LANDINGS</li> <li>➤ SHORT-FIELD LANDING</li> <li>➤ GO-AROUND PROCEDURE</li> <li>➤ ENGINE INOPERATIVE EMERGENCIES</li> <li>➤ ENGINE INOPERATIVE PROCEDURES</li> <li>➤ VMC DEMONSTRATIONS</li> <li>➤ ENGINE FAILURE BEFORE LIFT-OFF (REJECTED TAKEOFF)</li> <li>➤ ENGINE FAILURE AFTER LIFT-OFF</li> <li>➤ ENGINE FAILURE EN ROUTE</li> <li>➤ ENGINE INOPERATIVE APPROACH AND LANDING</li> <li>➤ REVIEW &amp; EVALUATION</li> </ul>	

## APPENDIX 4

<b>SUBJECT DETAILS</b>	
<b>FLIGHT INSTRUCTOR INITIAL TRAINING</b>	
INSTRUCTIONAL HOURS:	<b>130</b>
NUMBER OF LECTURES:	<b>26</b>
LECTURE DURATION (WITHOUT BREAK):	<b>5</b>
NUMBER OF PRESENTATIONS:	<b>2</b>
NUMBER OF SAMPLE EXAMS (MINIMUM):	
<b>GENERAL DESCRIPTION &amp; OBJECTIVES OF SUBJECT TRAINING</b>	
<ul style="list-style-type: none"> <li>✓ THE LEARNING PROCESS</li> <li>✓ THE TEACHING PROCESS</li> <li>✓ TRAINING PHILOSOPHIES</li> <li>✓ TECHNIQUES OF APPLIED INSTRUCTION</li> <li>✓ STUDENT EVALUATION AND TESTING</li> <li>✓ TRAINING PROGRAMME DEVELOPMENT</li> <li>✓ HUMAN PERFORMANCE AND LIMITATIONS RELEVANT TO FLIGHT INSTRUCTION</li> <li>✓ HAZARDS INVOLVED IN SIMULATING SYSTEMS FAILURES AND MALFUNCTIONS IN THE AEROPLANE DURING FLIGHT</li> <li>✓ NIGHT FLYING INSTRUCTION</li> <li>✓ TRAINING ADMINISTRATION</li> <li>✓ PPL SYLLABUS</li> <li>✓ PRINCIPLES OF FLIGHTS RELEVANT TO PPL SYLLABUS</li> </ul>	



**TRAINING MANUAL  
PART 4  
Theoretical Knowledge  
Instruction**

Page: 266  
Revision: 1  
Date: 6 Feb 2009

**INTENTIONALLY LEFT BLANK**

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>FLIGHT INSTRUCTOR INITIAL TRAINING</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>1/26</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>THE LEARNING PROCESS</p> <ul style="list-style-type: none"> <li>➤ MOTIVATION</li> <li>➤ PERCEPTION AND UNDERSTANDING</li> <li>➤ MEMORY AND ITS APPLICATION</li> <li>➤ HABITS AND TRANSFER</li> <li>➤ OBSTACLES TO LEARNING</li> <li>➤ INCENTIVES TO LEARNING</li> <li>➤ LEARNING METHODS</li> <li>➤ RATES OF LEARNING</li> </ul>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>FLIGHT INSTRUCTOR INITIAL TRAINING</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>2/26</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>THE LEARNING PROCESS</p> <ul style="list-style-type: none"> <li>➤ MOTIVATION</li> <li>➤ PERCEPTION AND UNDERSTANDING</li> <li>➤ MEMORY AND ITS APPLICATION</li> <li>➤ HABITS AND TRANSFER</li> <li>➤ OBSTACLES TO LEARNING</li> <li>➤ INCENTIVES TO LEARNING</li> <li>➤ LEARNING METHODS</li> <li>➤ RATES OF LEARNING</li> </ul>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>FLIGHT INSTRUCTOR INITIAL TRAINING</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>3/26</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>THE LEARNING PROCESS</p> <ul style="list-style-type: none"> <li>➤ MOTIVATION</li> <li>➤ PERCEPTION AND UNDERSTANDING</li> <li>➤ MEMORY AND ITS APPLICATION</li> <li>➤ HABITS AND TRANSFER</li> <li>➤ OBSTACLES TO LEARNING</li> <li>➤ INCENTIVES TO LEARNING</li> <li>➤ LEARNING METHODS</li> <li>➤ RATES OF LEARNING</li> </ul>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>FLIGHT INSTRUCTOR INITIAL TRAINING</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>4/26</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>THE LEARNING PROCESS</p> <ul style="list-style-type: none"> <li>➤ MOTIVATION</li> <li>➤ PERCEPTION AND UNDERSTANDING</li> <li>➤ MEMORY AND ITS APPLICATION</li> <li>➤ HABITS AND TRANSFER</li> <li>➤ OBSTACLES TO LEARNING</li> <li>➤ INCENTIVES TO LEARNING</li> <li>➤ LEARNING METHODS</li> <li>➤ RATES OF LEARNING</li> </ul>	



<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>FLIGHT INSTRUCTOR INITIAL TRAINING</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>5/26</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>THE LEARNING PROCESS</p> <ul style="list-style-type: none"> <li>➤ MOTIVATION</li> <li>➤ PERCEPTION AND UNDERSTANDING</li> <li>➤ MEMORY AND ITS APPLICATION</li> <li>➤ HABITS AND TRANSFER</li> <li>➤ OBSTACLES TO LEARNING</li> <li>➤ INCENTIVES TO LEARNING</li> <li>➤ LEARNING METHODS</li> <li>➤ RATES OF LEARNING</li> </ul>	

**LECTURE DETAILS**

SUBJECT TITLE: **FLIGHT INSTRUCTOR INITIAL TRAINING**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **6/26**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

THE TEACHING PROCESS

- ELEMENTS OF EFFECTIVE TEACHING
- PLANNING OF INSTRUCTIONAL ACTIVITY
- TEACHING METHODS
- TEACHING FROM "KNOWN" TO "UNKNOWN"
- USE OF "LESSON PLANS"

**LECTURE DETAILS**

SUBJECT TITLE: **FLIGHT INSTRUCTOR INITIAL TRAINING**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **7/26**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

THE TEACHING PROCESS

- ELEMENTS OF EFFECTIVE TEACHING
- PLANNING OF INSTRUCTIONAL ACTIVITY
- TEACHING METHODS
- TEACHING FROM "KNOWN" TO "UNKNOWN"
- USE OF "LESSON PLANS"

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>FLIGHT INSTRUCTOR INITIAL TRAINING</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>8/26</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>THE TEACHING PROCESS</p> <ul style="list-style-type: none"> <li>➤ ELEMENTS OF EFFECTIVE TEACHING</li> <li>➤ PLANNING OF INSTRUCTIONAL ACTIVITY</li> <li>➤ TEACHING METHODS</li> <li>➤ TEACHING FROM "KNOWN" TO "UNKNOWN"</li> <li>➤ USE OF "LESSON PLANS"</li> </ul>	

**LECTURE DETAILS**

SUBJECT TITLE: **FLIGHT INSTRUCTOR INITIAL TRAINING**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **9/26**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

THE TEACHING PROCESS

- ELEMENTS OF EFFECTIVE TEACHING
- PLANNING OF INSTRUCTIONAL ACTIVITY
- TEACHING METHODS
- TEACHING FROM "KNOWN" TO "UNKNOWN"
- USE OF "LESSON PLANS"

**LECTURE DETAILS**

SUBJECT TITLE: **FLIGHT INSTRUCTOR INITIAL TRAINING**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **10/26**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

THE TEACHING PROCESS

- ELEMENTS OF EFFECTIVE TEACHING
- PLANNING OF INSTRUCTIONAL ACTIVITY
- TEACHING METHODS
- TEACHING FROM "KNOWN" TO "UNKNOWN"
- USE OF "LESSON PLANS"

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>FLIGHT INSTRUCTOR INITIAL TRAINING</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>11/26</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>TRAINING PHILOSOPHIES</p> <ul style="list-style-type: none"> <li>➤ VALUE OF A STRUCTURED (APPROVED) COURSE OF TRAINING</li> <li>➤ IMPORTANCE OF A PLANNED SYLLABUS</li> <li>➤ INTEGRATION OF THEORETICAL KNOWLEDGE AND FLIGHT INSTRUCTION</li> </ul>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>FLIGHT INSTRUCTOR INITIAL TRAINING</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>12/26</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>TECHNIQUES OF APPLIED INSTRUCTION</p> <ul style="list-style-type: none"> <li>➤ THEORETICAL KNOWLEDGE – CLASSROOM INSTRUCTION TECHNIQUES</li> <li>➤ FLIGHTS – AIRBORNE INSTRUCTION TECHNIQUES</li> </ul>	



<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>FLIGHT INSTRUCTOR INITIAL TRAINING</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>13/26</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>TECHNIQUES OF APPLIED INSTRUCTION</p> <ul style="list-style-type: none"> <li>➤ THEORETICAL KNOWLEDGE – CLASSROOM INSTRUCTION TECHNIQUES</li> <li>➤ FLIGHTS – AIRBORNE INSTRUCTION TECHNIQUES</li> </ul>	

**LECTURE DETAILS**

SUBJECT TITLE: **FLIGHT INSTRUCTOR INITIAL TRAINING**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **14/26**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

STUDENT EVALUATION AND TESTING

- ASSESSMENT OF STUDENT PERFORMANCE
- ANALYSIS OF STUDENT ERRORS

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>FLIGHT INSTRUCTOR INITIAL TRAINING</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>15/26</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>TRAINING PROGRAMME DEVELOPMENT</p> <ul style="list-style-type: none"> <li>➤ LESSON PLANNING</li> <li>➤ PREPARATION</li> <li>➤ EXPLANATION AND DEMONSTRATION</li> <li>➤ STUDENT PARTICIPATION AND PRACTICE</li> <li>➤ EVALUATION</li> </ul> <p>TECHNIQUES OF APPLIED INSTRUCTION</p> <ul style="list-style-type: none"> <li>➤ THEORETICAL KNOWLEDGE – CLASSROOM INSTRUCTION TECHNIQUES</li> <li>➤ FLIGHTS – AIRBORNE INSTRUCTION TECHNIQUES</li> </ul> <p>PRESENTATION OF SUBJECT FROM STUDENT(S)</p>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>FLIGHT INSTRUCTOR INITIAL TRAINING</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>16/26</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>HUMAN PERFORMANCE AND LIMITATIONS RELEVANT TO FLIGHT INSTRUCTION</p> <ul style="list-style-type: none"> <li>➤ PHYSIOLOGICAL FACTORS</li> <li>➤ PSYCHOLOGICAL FACTORS</li> <li>➤ HUMAN INFORMATION PROCESSING</li> <li>➤ BEHAVIORAL ATTITUDES</li> <li>➤ DEVELOPMENT OF JUDGMENT AND DECISION MAKING</li> </ul> <p>TECHNIQUES OF APPLIED INSTRUCTION</p> <ul style="list-style-type: none"> <li>➤ THEORETICAL KNOWLEDGE – CLASSROOM INSTRUCTION TECHNIQUES</li> <li>➤ FLIGHTS – AIRBORNE INSTRUCTION TECHNIQUES</li> </ul> <p>PRESENTATION OF SUBJECT FROM STUDENT(S)</p>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>FLIGHT INSTRUCTOR INITIAL TRAINING</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>17/26</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>HUMAN PERFORMANCE AND LIMITATIONS RELEVANT TO FLIGHT INSTRUCTION</p> <ul style="list-style-type: none"> <li>➤ PHYSIOLOGICAL FACTORS</li> <li>➤ PSYCHOLOGICAL FACTORS</li> <li>➤ HUMAN INFORMATION PROCESSING</li> <li>➤ BEHAVIORAL ATTITUDES</li> <li>➤ DEVELOPMENT OF JUDGMENT AND DECISION MAKING</li> </ul> <p>TECHNIQUES OF APPLIED INSTRUCTION</p> <ul style="list-style-type: none"> <li>➤ THEORETICAL KNOWLEDGE – CLASSROOM INSTRUCTION TECHNIQUES</li> <li>➤ FLIGHTS – AIRBORNE INSTRUCTION TECHNIQUES</li> </ul> <p>PRESENTATION OF SUBJECT FROM STUDENT(S)</p>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>FLIGHT INSTRUCTOR INITIAL TRAINING</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>18/26</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>HUMAN PERFORMANCE AND LIMITATIONS RELEVANT TO FLIGHT INSTRUCTION</p> <ul style="list-style-type: none"> <li>➤ PHYSIOLOGICAL FACTORS</li> <li>➤ PSYCHOLOGICAL FACTORS</li> <li>➤ HUMAN INFORMATION PROCESSING</li> <li>➤ BEHAVIORAL ATTITUDES</li> <li>➤ DEVELOPMENT OF JUDGMENT AND DECISION MAKING</li> </ul> <p>TECHNIQUES OF APPLIED INSTRUCTION</p> <ul style="list-style-type: none"> <li>➤ THEORETICAL KNOWLEDGE – CLASSROOM INSTRUCTION TECHNIQUES</li> <li>➤ FLIGHTS – AIRBORNE INSTRUCTION TECHNIQUES</li> </ul> <p>PRESENTATION OF SUBJECT FROM STUDENT(S)</p>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>FLIGHT INSTRUCTOR INITIAL TRAINING</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>19/26</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>HAZARDS INVOLVED IN SIMULATING SYSTEMS FAILURES AND MALFUNCTIONS IN THE AEROPLANE DURING FLIGHT</p> <ul style="list-style-type: none"> <li>➤ SELECTION OF SAFE ALTITUDE</li> <li>➤ IMPORTANCE OF "TOUCH DRILLS"</li> <li>➤ SITUATIONAL AWARENESS</li> <li>➤ ADHERENCE TO CORRECT PROCEDURES</li> </ul> <p>TECHNIQUES OF APPLIED INSTRUCTION</p> <ul style="list-style-type: none"> <li>➤ THEORETICAL KNOWLEDGE – CLASSROOM INSTRUCTION TECHNIQUES</li> <li>➤ FLIGHTS – AIRBORNE INSTRUCTION TECHNIQUES</li> </ul> <p>PRESENTATION OF SUBJECT FROM STUDENT(S)</p>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>FLIGHT INSTRUCTOR INITIAL TRAINING</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>20/26</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>HAZARDS INVOLVED IN SIMULATING SYSTEMS FAILURES AND MALFUNCTIONS IN THE AEROPLANE DURING FLIGHT</p> <ul style="list-style-type: none"> <li>➤ SELECTION OF SAFE ALTITUDE</li> <li>➤ IMPORTANCE OF "TOUCH DRILLS"</li> <li>➤ SITUATIONAL AWARENESS</li> <li>➤ ADHERENCE TO CORRECT PROCEDURES</li> </ul> <p>TECHNIQUES OF APPLIED INSTRUCTION</p> <ul style="list-style-type: none"> <li>➤ THEORETICAL KNOWLEDGE – CLASSROOM INSTRUCTION TECHNIQUES</li> <li>➤ FLIGHTS – AIRBORNE INSTRUCTION TECHNIQUES</li> </ul> <p>PRESENTATION OF SUBJECT FROM STUDENT(S)</p>	



**LECTURE DETAILS**

SUBJECT TITLE: **FLIGHT INSTRUCTOR INITIAL TRAINING**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **21/26**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

HAZARDS INVOLVED IN SIMULATING SYSTEMS FAILURES AND MALFUNCTIONS IN THE AEROPLANE DURING FLIGHT

- SELECTION OF SAFE ALTITUDE
- IMPORTANCE OF "TOUCH DRILLS"
- SITUATIONAL AWARENESS
- ADHERENCE TO CORRECT PROCEDURES

NIGHT FLYING INSTRUCTION

- OBJECTIVES
- LEGISLATION REQUIREMENTS
- AEROPLANE EQUIPMENT
- AEROPLANE LIGHTS
- FLIGHT CREW LICENSES
- AERODROME LICENSES (IF APPLICABLE)
- NIGHT FAMILIARISATION
- PREPARATION FOR FLIGHT
- EQUIPMENT REQUIRED FOR FLIGHT
- NIGHT VISION ACCOMMODATION
- PERSONAL SAFETY PRECAUTIONS IN THE PARKING AREAS
- EXTERNAL/INTERNAL CHECKS – NIGHT CONSIDERATIONS
- AEROPLANE LIGHTS – OPERATION

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>FLIGHT INSTRUCTOR INITIAL TRAINING</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>22/26</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>NIGHT FLYING INSTRUCTION</p> <ul style="list-style-type: none"> <li>➤ OBJECTIVES</li> <li>➤ LEGISLATION REQUIREMENTS</li> <li>➤ AEROPLANE EQUIPMENT</li> <li>➤ AEROPLANE LIGHTS</li> <li>➤ FLIGHT CREW LICENSES</li> <li>➤ AERODROME LICENSES (IF APPLICABLE)</li> <li>➤ NIGHT FAMILIARIZATION</li> <li>➤ PREPARATION FOR FLIGHT</li> <li>➤ EQUIPMENT REQUIRED FOR FLIGHT</li> <li>➤ NIGHT VISION ACCOMMODATION</li> <li>➤ PERSONAL SAFETY PRECAUTIONS IN THE PARKING AREAS</li> <li>➤ EXTERNAL/INTERNAL CHECKS – NIGHT CONSIDERATIONS</li> <li>➤ AEROPLANE LIGHTS – OPERATION</li> </ul> <p>TECHNIQUES OF APPLIED INSTRUCTION</p> <ul style="list-style-type: none"> <li>➤ THEORETICAL KNOWLEDGE – CLASSROOM INSTRUCTION TECHNIQUES</li> <li>➤ FLIGHTS – AIRBORNE INSTRUCTION TECHNIQUES</li> </ul> <p>PRESENTATION OF SUBJECT FROM STUDENT(S)</p>	

**LECTURE DETAILS**

SUBJECT TITLE: **FLIGHT INSTRUCTOR INITIAL TRAINING**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **23/26**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

TRAINING ADMINISTRATION

- FLIGHT/THEORETICAL KNOWLEDGE INSTRUCTION RECORDS
- PILOT'S PERSONAL FLYING LOG BOOK
- THE FLIGHT/GROUND CURRICULUM
- STUDY MATERIAL
- OFFICIAL FORMS
- AIRCRAFT FLIGHT/OWNER'S MANUAL/PILOT'S OPERATING HANDBOOKS
- FLIGHT AUTHORISATION PAPERS
- AIRCRAFT DOCUMENTS
- THE PRIVATE PILOT'S LICENSE REGULATIONS

TECHNIQUES OF APPLIED INSTRUCTION

- THEORETICAL KNOWLEDGE – CLASSROOM INSTRUCTION TECHNIQUES
- FLIGHTS – AIRBORNE INSTRUCTION TECHNIQUES

PRESENTATION OF SUBJECT FROM STUDENT(S)

**LECTURE DETAILS**

SUBJECT TITLE: **FLIGHT INSTRUCTOR INITIAL TRAINING**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **24/26**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

TRAINING ADMINISTRATION

- FLIGHT/THEORETICAL KNOWLEDGE INSTRUCTION RECORDS
- PILOT'S PERSONAL FLYING LOG BOOK
- THE FLIGHT/GROUND CURRICULUM
- STUDY MATERIAL
- OFFICIAL FORMS
- AIRCRAFT FLIGHT/OWNER'S MANUAL/PILOT'S OPERATING HANDBOOKS
- FLIGHT AUTHORISATION PAPERS
- AIRCRAFT DOCUMENTS
- THE PRIVATE PILOT'S LICENSE REGULATIONS

PPL SYLLABUS

PRINCIPLES OF FLIGHTS RELEVANT TO PPL SYLLABUS

TECHNIQUES OF APPLIED INSTRUCTION

- THEORETICAL KNOWLEDGE – CLASSROOM INSTRUCTION TECHNIQUES
- FLIGHTS – AIRBORNE INSTRUCTION TECHNIQUES

PRESENTATION OF SUBJECT FROM STUDENT(S)

**LECTURE DETAILS**

SUBJECT TITLE: **FLIGHT INSTRUCTOR INITIAL TRAINING**

DURATION: 5 HOURS

BREAK DURATION: 5 MINS

LECTURE NUMBER: **25/26**

TOTAL BREAK DURATION: 15 MINS

**CONTENTS & OBJECTIVES**

TRAINING ADMINISTRATION

- FLIGHT/THEORETICAL KNOWLEDGE INSTRUCTION RECORDS
- PILOT'S PERSONAL FLYING LOG BOOK
- THE FLIGHT/GROUND CURRICULUM
- STUDY MATERIAL
- OFFICIAL FORMS
- AIRCRAFT FLIGHT/OWNER'S MANUAL/PILOT'S OPERATING HANDBOOKS
- FLIGHT AUTHORISATION PAPERS
- AIRCRAFT DOCUMENTS
- THE PRIVATE PILOT'S LICENSE REGULATIONS

PPL SYLLABUS

PRINCIPLES OF FLIGHTS RELEVANT TO PPL SYLLABUS

TECHNIQUES OF APPLIED INSTRUCTION

- THEORETICAL KNOWLEDGE – CLASSROOM INSTRUCTION TECHNIQUES
- FLIGHTS – AIRBORNE INSTRUCTION TECHNIQUES

PRESENTATION OF SUBJECT FROM STUDENT(S)

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>FLIGHT INSTRUCTOR INITIAL TRAINING</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>26/26</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PPL SYLLABUS</p> <p>PRINCIPLES OF FLIGHTS RELEVANT TO PPL SYLLABUS</p> <p>TECHNIQUES OF APPLIED INSTRUCTION</p> <ul style="list-style-type: none"> <li>➤ THEORETICAL KNOWLEDGE – CLASSROOM INSTRUCTION TECHNIQUES</li> <li>➤ FLIGHTS – AIRBORNE INSTRUCTION TECHNIQUES</li> </ul> <p>FINAL PRESENTATION OF SUBJECT FROM STUDENT(S)</p>	

## APPENDIX 5

<b>SUBJECT DETAILS</b>	
<b>CLASS RATING INSTRUCTOR INITIAL TRAINING</b>	
INSTRUCTIONAL HOURS:	<b>120</b>
NUMBER OF LECTURES:	<b>24</b>
LECTURE DURATION (WITHOUT BREAK):	<b>5</b>
NUMBER OF PRESENTATIONS:	<b>2</b>
NUMBER OF SAMPLE EXAMS (MINIMUM):	
<b>GENERAL DESCRIPTION &amp; OBJECTIVES OF SUBJECT TRAINING</b>	
<p>PART 1: TEACHING AND LEARNING</p> <ul style="list-style-type: none"> <li>✓ THE LEARNING PROCESS</li> <li>✓ THE TEACHING PROCESS</li> <li>✓ TRAINING PHILOSOPHIES</li> <li>✓ TECHNIQUES OF APPLIED INSTRUCTION</li> <li>✓ STUDENT EVALUATION AND TESTING</li> <li>✓ TRAINING PROGRAMME DEVELOPMENT</li> <li>✓ HUMAN PERFORMANCE AND LIMITATIONS RELEVANT TO FLIGHT INSTRUCTION</li> <li>✓ HAZARDS INVOLVED IN SIMULATING SYSTEMS FAILURES AND MALFUNCTIONS IN THE AEROPLANE DURING FLIGHT</li> <li>✓ TRAINING ADMINISTRATION</li> </ul> <p>PART 2: CLASS RATING INSTRUCTOR THEORETICAL SYLLABUS</p> <ul style="list-style-type: none"> <li>✓ AVIATION LEGISLATION</li> <li>✓ ASYMMETRIC POWER FLIGHT – PRINCIPLES OF FLIGHT</li> <li>✓ CONTROL IN ASYMMETRIC POWER FLIGHT</li> <li>✓ AEROPLANE PERFORMANCE-ONE ENGINE INOPERATIVE</li> <li>✓ SPECIFIC AEROPLANE TYPE</li> </ul>	



**TRAINING MANUAL  
PART 4  
Theoretical Knowledge  
Instruction**

Page: 294  
Revision: 1  
Date: 6 Feb 2009

**INTENTIONALLY LEFT BLANK**



<b>LECTURE DETAILS</b>			
SUBJECT TITLE:		<b>CLASS RATING INSTRUCTOR INITIAL TRAINING</b>	
DURATION:	5 HOURS	BREAK DURATION:	5 MINS
LECTURE NUMBER:	<b>1/24</b>	TOTAL BREAK DURATION:	15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>			
<p>PART 1: TEACHING AND LEARNING THE LEARNING PROCESS</p> <ul style="list-style-type: none"> <li>➤ MOTIVATION</li> <li>➤ PERCEPTION AND UNDERSTANDING</li> <li>➤ MEMORY AND ITS APPLICATION</li> <li>➤ HABITS AND TRANSFER</li> <li>➤ OBSTACLES TO LEARNING</li> <li>➤ INCENTIVES TO LEARNING</li> <li>➤ LEARNING METHODS</li> <li>➤ RATES OF LEARNING</li> </ul>			

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>CLASS RATING INSTRUCTOR INITIAL TRAINING</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>2/24</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PART 1: TEACHING AND LEARNING THE LEARNING PROCESS</p> <ul style="list-style-type: none"> <li>➤ MOTIVATION</li> <li>➤ PERCEPTION AND UNDERSTANDING</li> <li>➤ MEMORY AND ITS APPLICATION</li> <li>➤ HABITS AND TRANSFER</li> <li>➤ OBSTACLES TO LEARNING</li> <li>➤ INCENTIVES TO LEARNING</li> <li>➤ LEARNING METHODS</li> <li>➤ RATES OF LEARNING</li> </ul>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>CLASS RATING INSTRUCTOR INITIAL TRAINING</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>3/24</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PART 1: TEACHING AND LEARNING THE LEARNING PROCESS</p> <ul style="list-style-type: none"> <li>➤ MOTIVATION</li> <li>➤ PERCEPTION AND UNDERSTANDING</li> <li>➤ MEMORY AND ITS APPLICATION</li> <li>➤ HABITS AND TRANSFER</li> <li>➤ OBSTACLES TO LEARNING</li> <li>➤ INCENTIVES TO LEARNING</li> <li>➤ LEARNING METHODS</li> <li>➤ RATES OF LEARNING</li> </ul>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>CLASS RATING INSTRUCTOR INITIAL TRAINING</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>4/24</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PART 1: TEACHING AND LEARNING THE LEARNING PROCESS</p> <ul style="list-style-type: none"> <li>➤ MOTIVATION</li> <li>➤ PERCEPTION AND UNDERSTANDING</li> <li>➤ MEMORY AND ITS APPLICATION</li> <li>➤ HABITS AND TRANSFER</li> <li>➤ OBSTACLES TO LEARNING</li> <li>➤ INCENTIVES TO LEARNING</li> <li>➤ LEARNING METHODS</li> <li>➤ RATES OF LEARNING</li> </ul> <p>TECHNIQUES OF APPLIED INSTRUCTION</p> <ul style="list-style-type: none"> <li>➤ THEORETICAL KNOWLEDGE – CLASSROOM INSTRUCTION TECHNIQUES</li> <li>➤ FLIGHTS – AIRBORNE INSTRUCTION TECHNIQUES</li> </ul> <p>PRESENTATION OF SUBJECT FROM STUDENT(S)</p>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>CLASS RATING INSTRUCTOR INITIAL TRAINING</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>5/24</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PART 1: TEACHING AND LEARNING THE TEACHING PROCESS</p> <ul style="list-style-type: none"> <li>➤ ELEMENTS OF EFFECTIVE TEACHING</li> <li>➤ PLANNING OF INSTRUCTIONAL ACTIVITY</li> <li>➤ TEACHING METHODS</li> <li>➤ TEACHING FROM "KNOWN" TO "UNKNOWN"</li> <li>➤ USE OF "LESSON PLANS"</li> </ul>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>CLASS RATING INSTRUCTOR INITIAL TRAINING</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>6/24</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PART 1: TEACHING AND LEARNING THE TEACHING PROCESS</p> <ul style="list-style-type: none"> <li>➤ ELEMENTS OF EFFECTIVE TEACHING</li> <li>➤ PLANNING OF INSTRUCTIONAL ACTIVITY</li> <li>➤ TEACHING METHODS</li> <li>➤ TEACHING FROM "KNOWN" TO "UNKNOWN"</li> <li>➤ USE OF "LESSON PLANS"</li> </ul>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>CLASS RATING INSTRUCTOR INITIAL TRAINING</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>7/24</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PART 1: TEACHING AND LEARNING THE TEACHING PROCESS</p> <ul style="list-style-type: none"> <li>➤ ELEMENTS OF EFFECTIVE TEACHING</li> <li>➤ PLANNING OF INSTRUCTIONAL ACTIVITY</li> <li>➤ TEACHING METHODS</li> <li>➤ TEACHING FROM "KNOWN" TO "UNKNOWN"</li> <li>➤ USE OF "LESSON PLANS"</li> </ul>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>CLASS RATING INSTRUCTOR INITIAL TRAINING</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>8/24</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PART 1: TEACHING AND LEARNING THE TEACHING PROCESS</p> <ul style="list-style-type: none"> <li>➤ ELEMENTS OF EFFECTIVE TEACHING</li> <li>➤ PLANNING OF INSTRUCTIONAL ACTIVITY</li> <li>➤ TEACHING METHODS</li> <li>➤ TEACHING FROM "KNOWN" TO "UNKNOWN"</li> <li>➤ USE OF "LESSON PLANS"</li> </ul> <p>TECHNIQUES OF APPLIED INSTRUCTION</p> <ul style="list-style-type: none"> <li>➤ THEORETICAL KNOWLEDGE – CLASSROOM INSTRUCTION TECHNIQUES</li> <li>➤ FLIGHTS – AIRBORNE INSTRUCTION TECHNIQUES</li> </ul> <p>PRESENTATION OF SUBJECT FROM STUDENT(S)</p>	



<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>CLASS RATING INSTRUCTOR INITIAL TRAINING</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>9/24</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PART 1: TEACHING AND LEARNING TRAINING PHILOSOPHIES</p> <ul style="list-style-type: none"> <li>➤ VALUE OF A STRUCTURED (APPROVED) COURSE OF TRAINING</li> <li>➤ IMPORTANCE OF A PLANNED SYLLABUS</li> <li>➤ INTEGRATION OF THEORETICAL KNOWLEDGE AND FLIGHT INSTRUCTION</li> </ul>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>CLASS RATING INSTRUCTOR INITIAL TRAINING</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>10/24</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PART 1: TEACHING AND LEARNING TECHNIQUES OF APPLIED INSTRUCTION</p> <ul style="list-style-type: none"> <li>➤ THEORETICAL KNOWLEDGE – CLASSROOM INSTRUCTION TECHNIQUES</li> <li>➤ FLIGHTS – AIRBORNE INSTRUCTION TECHNIQUES</li> </ul>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>CLASS RATING INSTRUCTOR INITIAL TRAINING</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>11/24</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PART 1: TEACHING AND LEARNING TECHNIQUES OF APPLIED INSTRUCTION</p> <ul style="list-style-type: none"> <li>➤ THEORETICAL KNOWLEDGE – CLASSROOM INSTRUCTION TECHNIQUES</li> <li>➤ FLIGHTS – AIRBORNE INSTRUCTION TECHNIQUES</li> </ul>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>CLASS RATING INSTRUCTOR INITIAL TRAINING</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>12/24</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PART 1: TEACHING AND LEARNING STUDENT EVALUATION AND TESTING</p> <ul style="list-style-type: none"> <li>➤ ASSESSMENT OF STUDENT PERFORMANCE</li> <li>➤ ANALYSIS OF STUDENT ERRORS</li> </ul>	

**LECTURE DETAILS**

SUBJECT TITLE:		<b>CLASS RATING INSTRUCTOR INITIAL TRAINING</b>	
DURATION:	5 HOURS	BREAK DURATION:	5 MINS
LECTURE NUMBER:	<b>13/24</b>	TOTAL BREAK DURATION:	15 MINS

**CONTENTS & OBJECTIVES**

PART 1: TEACHING AND LEARNING  
TRAINING PROGRAMME DEVELOPMENT

- LESSON PLANNING
- PREPARATION
- EXPLANATION AND DEMONSTRATION
- STUDENT PARTICIPATION AND PRACTICE
- EVALUATION

TECHNIQUES OF APPLIED INSTRUCTION

- THEORETICAL KNOWLEDGE – CLASSROOM INSTRUCTION TECHNIQUES
- FLIGHTS – AIRBORNE INSTRUCTION TECHNIQUES

PRESENTATION OF SUBJECT FROM STUDENT(S)

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>CLASS RATING INSTRUCTOR INITIAL TRAINING</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>14/24</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PART 1: TEACHING AND LEARNING HUMAN PERFORMANCE AND LIMITATIONS RELEVANT TO FLIGHT INSTRUCTION</p> <ul style="list-style-type: none"> <li>➤ PHYSIOLOGICAL FACTORS</li> <li>➤ PSYCHOLOGICAL FACTORS</li> <li>➤ HUMAN INFORMATION PROCESSING</li> <li>➤ BEHAVIORAL ATTITUDES</li> <li>➤ DEVELOPMENT OF JUDGMENT AND DECISION MAKING</li> </ul> <p>TECHNIQUES OF APPLIED INSTRUCTION</p> <ul style="list-style-type: none"> <li>➤ THEORETICAL KNOWLEDGE – CLASSROOM INSTRUCTION TECHNIQUES</li> <li>➤ FLIGHTS – AIRBORNE INSTRUCTION TECHNIQUES</li> </ul> <p>PRESENTATION OF SUBJECT FROM STUDENT(S)</p>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>CLASS RATING INSTRUCTOR INITIAL TRAINING</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>15/24</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PART 1: TEACHING AND LEARNING HUMAN PERFORMANCE AND LIMITATIONS RELEVANT TO FLIGHT INSTRUCTION</p> <ul style="list-style-type: none"> <li>➤ PHYSIOLOGICAL FACTORS</li> <li>➤ PSYCHOLOGICAL FACTORS</li> <li>➤ HUMAN INFORMATION PROCESSING</li> <li>➤ BEHAVIORAL ATTITUDES</li> <li>➤ DEVELOPMENT OF JUDGMENT AND DECISION MAKING</li> </ul> <p>TECHNIQUES OF APPLIED INSTRUCTION</p> <ul style="list-style-type: none"> <li>➤ THEORETICAL KNOWLEDGE – CLASSROOM INSTRUCTION TECHNIQUES</li> <li>➤ FLIGHTS – AIRBORNE INSTRUCTION TECHNIQUES</li> </ul> <p>PRESENTATION OF SUBJECT FROM STUDENT(S)</p>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>CLASS RATING INSTRUCTOR INITIAL TRAINING</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>16/24</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PART 1: TEACHING AND LEARNING HAZARDS INVOLVED IN SIMULATING SYSTEMS FAILURES AND MALFUNCTIONS IN THE AEROPLANE DURING FLIGHT</p> <ul style="list-style-type: none"> <li>➤ SELECTION OF SAFE ALTITUDE</li> <li>➤ IMPORTANCE OF "TOUCH DRILLS"</li> <li>➤ SITUATIONAL AWARENESS</li> <li>➤ ADHERENCE TO CORRECT PROCEDURES</li> </ul> <p>TECHNIQUES OF APPLIED INSTRUCTION</p> <ul style="list-style-type: none"> <li>➤ THEORETICAL KNOWLEDGE – CLASSROOM INSTRUCTION TECHNIQUES</li> <li>➤ FLIGHTS – AIRBORNE INSTRUCTION TECHNIQUES</li> </ul> <p>PRESENTATION OF SUBJECT FROM STUDENT(S)</p>	



<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>CLASS RATING INSTRUCTOR INITIAL TRAINING</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>17/24</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PART 1: TEACHING AND LEARNING HAZARDS INVOLVED IN SIMULATING SYSTEMS FAILURES AND MALFUNCTIONS IN THE AEROPLANE DURING FLIGHT</p> <ul style="list-style-type: none"> <li>➤ SELECTION OF SAFE ALTITUDE</li> <li>➤ IMPORTANCE OF "TOUCH DRILLS"</li> <li>➤ SITUATIONAL AWARENESS</li> <li>➤ ADHERENCE TO CORRECT PROCEDURES</li> </ul> <p>TECHNIQUES OF APPLIED INSTRUCTION</p> <ul style="list-style-type: none"> <li>➤ THEORETICAL KNOWLEDGE – CLASSROOM INSTRUCTION TECHNIQUES</li> <li>➤ FLIGHTS – AIRBORNE INSTRUCTION TECHNIQUES</li> </ul> <p>PRESENTATION OF SUBJECT FROM STUDENT(S)</p>	

**LECTURE DETAILS**

SUBJECT TITLE:		<b>CLASS RATING INSTRUCTOR INITIAL TRAINING</b>	
DURATION:	5 HOURS	BREAK DURATION:	5 MINS
LECTURE NUMBER:	<b>18/24</b>	TOTAL BREAK DURATION:	15 MINS

**CONTENTS & OBJECTIVES**

**PART 1: TEACHING AND LEARNING  
TRAINING ADMINISTRATION**

- FLIGHT/THEORETICAL KNOWLEDGE INSTRUCTION RECORDS
- PILOT'S PERSONAL FLYING LOG BOOK
- THE FLIGHT/GROUND CURRICULUM
- STUDY MATERIAL
- OFFICIAL FORMS
- AIRCRAFT FLIGHT/OWNER'S MANUAL/PILOT'S OPERATING HANDBOOKS
- FLIGHT AUTHORISATION PAPERS
- AIRCRAFT DOCUMENTS
- THE PRIVATE PILOT'S LICENSE REGULATIONS

**TECHNIQUES OF APPLIED INSTRUCTION**

- THEORETICAL KNOWLEDGE – CLASSROOM INSTRUCTION TECHNIQUES
- FLIGHTS – AIRBORNE INSTRUCTION TECHNIQUES

**PRESENTATION OF SUBJECT FROM STUDENT(S)**

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>CLASS RATING INSTRUCTOR INITIAL TRAINING</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>19/24</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PART 2: CLASS RATING INSTRUCTOR THEORETICAL SYLLABUS</p> <p>AVIATION LEGISLATION</p> <ul style="list-style-type: none"> <li>➤ AEROPLANE PERFORMANCE GROUP DEFINITIONS (JAA)</li> <li>➤ METHODS OF FACTORING GROSS PERFORMANCE</li> </ul>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>CLASS RATING INSTRUCTOR INITIAL TRAINING</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>20/24</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PART 2: CLASS RATING INSTRUCTOR THEORETICAL SYLLABUS</p> <p>ASYMMETRIC POWER FLIGHT – PRINCIPLES OF FLIGHT</p> <ul style="list-style-type: none"> <li>➤ THE PROBLEMS</li> <li>➤ THE FORCES AND COUPLES</li> </ul>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>CLASS RATING INSTRUCTOR INITIAL TRAINING</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>21/24</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PART 2: CLASS RATING INSTRUCTOR THEORETICAL SYLLABUS</p> <p>CONTROL IN ASYMMETRIC POWER FLIGHT</p> <ul style="list-style-type: none"> <li>➤ USE, MISUSE AND LIMITS OF RUDDER, AILERON AND ELEVATORS</li> <li>➤ EFFECT OF BANK/SIDESLIP/BALANCE</li> <li>➤ DECREASE OF AILERON/RUDDER EFFECTIVENESS</li> <li>➤ FIN STALL POSSIBILITY</li> <li>➤ EFFECT OF IAS/THRUST RELATIONSHIP</li> <li>➤ EFFECT OF RESIDUAL UNBALANCED FORCES</li> <li>➤ FOOT LOADS AND TRIMMING</li> <li>➤ MINIMUM CONTROL AND SAFETY SPEEDS</li> </ul> <p>BRIEFING FOR AIR EXERCISES PROGRESS</p>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>CLASS RATING INSTRUCTOR INITIAL TRAINING</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>22/24</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PART 2: CLASS RATING INSTRUCTOR THEORETICAL SYLLABUS</p> <p>AEROPLANE PERFORMANCE-ONE ENGINE INOPERATIVE</p> <ul style="list-style-type: none"> <li>➤ EFFECT ON EXCESS POWER AVAILABLE</li> <li>➤ SINGLE-ENGINE CEILING</li> <li>➤ CRUISING, RANGE AND ENDURANCE</li> <li>➤ ACCELERATION/DECELERATION</li> <li>➤ ZERO THRUST, DEFINITION AND PURPOSE</li> <li>➤ PROPELLERS</li> </ul> <p>BRIEFING FOR AIR EXERCISES PROGRESS</p>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>CLASS RATING INSTRUCTOR INITIAL TRAINING</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>23/24</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PART 2: CLASS RATING INSTRUCTOR THEORETICAL SYLLABUS</p> <p>SPECIFIC AEROPLANE TYPE</p> <ul style="list-style-type: none"> <li>➤ AEROPLANE AND ENGINE SYSTEMS</li> <li>➤ LIMITATIONS-AIRFRAME</li> <li>➤ LIMITATIONS-ENGINE</li> <li>➤ MASS AND BALANCE</li> <li>➤ MASS AND PERFORMANCE</li> </ul> <p>BRIEFING FOR AIR EXERCISES PROGRESS</p>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE:	<b>CLASS RATING INSTRUCTOR INITIAL TRAINING</b>
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>24/24</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PART 2: CLASS RATING INSTRUCTOR THEORETICAL SYLLABUS</p> <p>SPECIFIC AEROPLANE TYPE</p> <ul style="list-style-type: none"> <li>➤ AEROPLANE AND ENGINE SYSTEMS</li> <li>➤ LIMITATIONS-AIRFRAME</li> <li>➤ LIMITATIONS-ENGINE</li> <li>➤ MASS AND BALANCE</li> <li>➤ MASS AND PERFORMANCE</li> </ul> <p>BRIEFING FOR AIR EXERCISES PROGRESS</p> <p>FINAL PRESENTATION OF SUBJECT FROM STUDENT(S)</p>	



## APPENDIX 6

<b>SUBJECT DETAILS</b>	
<b>INSTRUMENT RATING INSTRUCTOR INITIAL TRAINING</b>	
INSTRUCTIONAL HOURS:	<b>120</b>
NUMBER OF LECTURES:	<b>24</b>
LECTURE DURATION (WITHOUT BREAK):	<b>5</b>
NUMBER OF PRESENTATIONS:	<b>2</b>
NUMBER OF SAMPLE EXAMS (MINIMUM):	
<b>GENERAL DESCRIPTION &amp; OBJECTIVES OF SUBJECT TRAINING</b>	
<p><b>PART 1: TEACHING AND LEARNING</b></p> <ul style="list-style-type: none"> <li>✓ THE LEARNING PROCESS</li> <li>✓ THE TEACHING PROCESS</li> <li>✓ TRAINING PHILOSOPHIES</li> <li>✓ TECHNIQUES OF APPLIED INSTRUCTION</li> <li>✓ STUDENT EVALUATION AND TESTING</li> <li>✓ TRAINING PROGRAMME DEVELOPMENT</li> <li>✓ HUMAN PERFORMANCE AND LIMITATIONS RELEVANT TO FLIGHT INSTRUCTION</li> <li>✓ HAZARDS INVOLVED IN SIMULATING SYSTEMS FAILURES AND MALFUNCTIONS IN THE AEROPLANE DURING FLIGHT</li> <li>✓ TRAINING ADMINISTRATION</li> </ul> <p><b>PART 2: INSTRUMENT RATING INSTRUCTOR THEORETICAL SYLLABUS</b></p> <ul style="list-style-type: none"> <li>✓ PHYSIOLOGICAL/PSYCHOLOGICAL FACTORS</li> <li>✓ FLIGHT INSTRUMENTS</li> <li>✓ RADIO NAVIGATION AIDS</li> <li>✓ AERONAUTICAL INFORMATION PUBLICATIONS</li> <li>✓ FLIGHT PLANNING GENERAL</li> <li>✓ THE PRIVILEGES OF INSTRUMENT RATING</li> <li>✓ BRIEFING FOR AIR EXERCISES PROGRESS</li> </ul>	



**TRAINING MANUAL  
PART 4  
Theoretical Knowledge  
Instruction**

Page: 320  
Revision: 1  
Date: 6 Feb 2009

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>INSTRUMENT RATING INSTRUCTOR INITIAL TRAINING</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>1/24</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PART 1: TEACHING AND LEARNING THE LEARNING PROCESS</p> <ul style="list-style-type: none"> <li>➤ MOTIVATION</li> <li>➤ PERCEPTION AND UNDERSTANDING</li> <li>➤ MEMORY AND ITS APPLICATION</li> <li>➤ HABITS AND TRANSFER</li> <li>➤ OBSTACLES TO LEARNING</li> <li>➤ INCENTIVES TO LEARNING</li> <li>➤ LEARNING METHODS</li> <li>➤ RATES OF LEARNING</li> </ul>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>INSTRUMENT RATING INSTRUCTOR INITIAL TRAINING</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>2/24</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PART 1: TEACHING AND LEARNING THE LEARNING PROCESS</p> <ul style="list-style-type: none"> <li>➤ MOTIVATION</li> <li>➤ PERCEPTION AND UNDERSTANDING</li> <li>➤ MEMORY AND ITS APPLICATION</li> <li>➤ HABITS AND TRANSFER</li> <li>➤ OBSTACLES TO LEARNING</li> <li>➤ INCENTIVES TO LEARNING</li> <li>➤ LEARNING METHODS</li> <li>➤ RATES OF LEARNING</li> </ul>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>INSTRUMENT RATING INSTRUCTOR INITIAL TRAINING</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>3/24</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PART 1: TEACHING AND LEARNING THE LEARNING PROCESS</p> <ul style="list-style-type: none"> <li>➤ MOTIVATION</li> <li>➤ PERCEPTION AND UNDERSTANDING</li> <li>➤ MEMORY AND ITS APPLICATION</li> <li>➤ HABITS AND TRANSFER</li> <li>➤ OBSTACLES TO LEARNING</li> <li>➤ INCENTIVES TO LEARNING</li> <li>➤ LEARNING METHODS</li> <li>➤ RATES OF LEARNING</li> </ul>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>INSTRUMENT RATING INSTRUCTOR INITIAL TRAINING</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>4/24</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PART 1: TEACHING AND LEARNING THE LEARNING PROCESS</p> <ul style="list-style-type: none"> <li>➤ MOTIVATION</li> <li>➤ PERCEPTION AND UNDERSTANDING</li> <li>➤ MEMORY AND ITS APPLICATION</li> <li>➤ HABITS AND TRANSFER</li> <li>➤ OBSTACLES TO LEARNING</li> <li>➤ INCENTIVES TO LEARNING</li> <li>➤ LEARNING METHODS</li> <li>➤ RATES OF LEARNING</li> </ul> <p>TECHNIQUES OF APPLIED INSTRUCTION</p> <ul style="list-style-type: none"> <li>➤ THEORETICAL KNOWLEDGE – CLASSROOM INSTRUCTION TECHNIQUES</li> <li>➤ FLIGHTS – AIRBORNE INSTRUCTION TECHNIQUES</li> </ul> <p>PRESENTATION OF SUBJECT FROM STUDENT(S)</p>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>INSTRUMENT RATING INSTRUCTOR INITIAL TRAINING</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>5/24</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PART 1: TEACHING AND LEARNING THE TEACHING PROCESS</p> <ul style="list-style-type: none"> <li>➤ ELEMENTS OF EFFECTIVE TEACHING</li> <li>➤ PLANNING OF INSTRUCTIONAL ACTIVITY</li> <li>➤ TEACHING METHODS</li> <li>➤ TEACHING FROM "KNOWN" TO "UNKNOWN"</li> <li>➤ USE OF "LESSON PLANS"</li> </ul>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>INSTRUMENT RATING INSTRUCTOR INITIAL TRAINING</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>6/24</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PART 1: TEACHING AND LEARNING THE TEACHING PROCESS</p> <ul style="list-style-type: none"> <li>➤ ELEMENTS OF EFFECTIVE TEACHING</li> <li>➤ PLANNING OF INSTRUCTIONAL ACTIVITY</li> <li>➤ TEACHING METHODS</li> <li>➤ TEACHING FROM "KNOWN" TO "UNKNOWN"</li> <li>➤ USE OF "LESSON PLANS"</li> </ul>	



<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>INSTRUMENT RATING INSTRUCTOR INITIAL TRAINING</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>7/24</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PART 1: TEACHING AND LEARNING THE TEACHING PROCESS</p> <ul style="list-style-type: none"> <li>➤ ELEMENTS OF EFFECTIVE TEACHING</li> <li>➤ PLANNING OF INSTRUCTIONAL ACTIVITY</li> <li>➤ TEACHING METHODS</li> <li>➤ TEACHING FROM "KNOWN" TO "UNKNOWN"</li> <li>➤ USE OF "LESSON PLANS"</li> </ul>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>INSTRUMENT RATING INSTRUCTOR INITIAL TRAINING</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>8/24</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PART 1: TEACHING AND LEARNING THE TEACHING PROCESS</p> <ul style="list-style-type: none"> <li>➤ ELEMENTS OF EFFECTIVE TEACHING</li> <li>➤ PLANNING OF INSTRUCTIONAL ACTIVITY</li> <li>➤ TEACHING METHODS</li> <li>➤ TEACHING FROM "KNOWN" TO "UNKNOWN"</li> <li>➤ USE OF "LESSON PLANS"</li> </ul> <p>TECHNIQUES OF APPLIED INSTRUCTION</p> <ul style="list-style-type: none"> <li>➤ THEORETICAL KNOWLEDGE – CLASSROOM INSTRUCTION TECHNIQUES</li> <li>➤ FLIGHTS – AIRBORNE INSTRUCTION TECHNIQUES</li> </ul> <p>PRESENTATION OF SUBJECT FROM STUDENT(S)</p>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>INSTRUMENT RATING INSTRUCTOR INITIAL TRAINING</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>9/24</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PART 1: TEACHING AND LEARNING TRAINING PHILOSOPHIES</p> <ul style="list-style-type: none"> <li>➤ VALUE OF A STRUCTURED (APPROVED) COURSE OF TRAINING</li> <li>➤ IMPORTANCE OF A PLANNED SYLLABUS</li> <li>➤ INTEGRATION OF THEORETICAL KNOWLEDGE AND FLIGHT INSTRUCTION</li> </ul>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>INSTRUMENT RATING INSTRUCTOR INITIAL TRAINING</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>10/24</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PART 1: TEACHING AND LEARNING TECHNIQUES OF APPLIED INSTRUCTION</p> <ul style="list-style-type: none"> <li>➤ THEORETICAL KNOWLEDGE – CLASSROOM INSTRUCTION TECHNIQUES</li> <li>➤ FLIGHTS – AIRBORNE INSTRUCTION TECHNIQUES</li> </ul>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>INSTRUMENT RATING INSTRUCTOR INITIAL TRAINING</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>11/24</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PART 1: TEACHING AND LEARNING TECHNIQUES OF APPLIED INSTRUCTION</p> <ul style="list-style-type: none"> <li>➤ THEORETICAL KNOWLEDGE – CLASSROOM INSTRUCTION TECHNIQUES</li> <li>➤ FLIGHTS – AIRBORNE INSTRUCTION TECHNIQUES</li> </ul>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>INSTRUMENT RATING INSTRUCTOR INITIAL TRAINING</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>12/24</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PART 1: TEACHING AND LEARNING STUDENT EVALUATION AND TESTING</p> <ul style="list-style-type: none"> <li>➤ ASSESSMENT OF STUDENT PERFORMANCE</li> <li>➤ ANALYSIS OF STUDENT ERRORS</li> </ul>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>INSTRUMENT RATING INSTRUCTOR INITIAL TRAINING</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>13/24</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PART 1: TEACHING AND LEARNING TRAINING PROGRAMME DEVELOPMENT</p> <ul style="list-style-type: none"> <li>➤ LESSON PLANNING</li> <li>➤ PREPARATION</li> <li>➤ EXPLANATION AND DEMONSTRATION</li> <li>➤ STUDENT PARTICIPATION AND PRACTICE</li> <li>➤ EVALUATION</li> </ul> <p>TECHNIQUES OF APPLIED INSTRUCTION</p> <ul style="list-style-type: none"> <li>➤ THEORETICAL KNOWLEDGE – CLASSROOM INSTRUCTION TECHNIQUES</li> <li>➤ FLIGHTS – AIRBORNE INSTRUCTION TECHNIQUES</li> </ul> <p>PRESENTATION OF SUBJECT FROM STUDENT(S)</p>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>INSTRUMENT RATING INSTRUCTOR INITIAL TRAINING</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>14/24</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PART 1: TEACHING AND LEARNING HUMAN PERFORMANCE AND LIMITATIONS RELEVANT TO FLIGHT INSTRUCTION</p> <ul style="list-style-type: none"> <li>➤ PHYSIOLOGICAL FACTORS</li> <li>➤ PSYCHOLOGICAL FACTORS</li> <li>➤ HUMAN INFORMATION PROCESSING</li> <li>➤ BEHAVIORAL ATTITUDES</li> <li>➤ DEVELOPMENT OF JUDGMENT AND DECISION MAKING</li> </ul> <p>TECHNIQUES OF APPLIED INSTRUCTION</p> <ul style="list-style-type: none"> <li>➤ THEORETICAL KNOWLEDGE – CLASSROOM INSTRUCTION TECHNIQUES</li> <li>➤ FLIGHTS – AIRBORNE INSTRUCTION TECHNIQUES</li> </ul> <p>PRESENTATION OF SUBJECT FROM STUDENT(S)</p>	



<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>INSTRUMENT RATING INSTRUCTOR INITIAL TRAINING</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>15/24</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PART 1: TEACHING AND LEARNING HUMAN PERFORMANCE AND LIMITATIONS RELEVANT TO FLIGHT INSTRUCTION</p> <ul style="list-style-type: none"> <li>➤ PHYSIOLOGICAL FACTORS</li> <li>➤ PSYCHOLOGICAL FACTORS</li> <li>➤ HUMAN INFORMATION PROCESSING</li> <li>➤ BEHAVIORAL ATTITUDES</li> <li>➤ DEVELOPMENT OF JUDGMENT AND DECISION MAKING</li> </ul> <p>TECHNIQUES OF APPLIED INSTRUCTION</p> <ul style="list-style-type: none"> <li>➤ THEORETICAL KNOWLEDGE – CLASSROOM INSTRUCTION TECHNIQUES</li> <li>➤ FLIGHTS – AIRBORNE INSTRUCTION TECHNIQUES</li> </ul> <p>PRESENTATION OF SUBJECT FROM STUDENT(S)</p>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>INSTRUMENT RATING INSTRUCTOR INITIAL TRAINING</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>16/24</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PART 1: TEACHING AND LEARNING HAZARDS INVOLVED IN SIMULATING SYSTEMS FAILURES AND MALFUNCTIONS IN THE AEROPLANE DURING FLIGHT</p> <ul style="list-style-type: none"> <li>➤ SELECTION OF SAFE ALTITUDE</li> <li>➤ IMPORTANCE OF "TOUCH DRILLS"</li> <li>➤ SITUATIONAL AWARENESS</li> <li>➤ ADHERENCE TO CORRECT PROCEDURES</li> </ul> <p>TECHNIQUES OF APPLIED INSTRUCTION</p> <ul style="list-style-type: none"> <li>➤ THEORETICAL KNOWLEDGE – CLASSROOM INSTRUCTION TECHNIQUES</li> <li>➤ FLIGHTS – AIRBORNE INSTRUCTION TECHNIQUES</li> </ul> <p>PRESENTATION OF SUBJECT FROM STUDENT(S)</p>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>INSTRUMENT RATING INSTRUCTOR INITIAL TRAINING</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>17/24</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PART 1: TEACHING AND LEARNING HAZARDS INVOLVED IN SIMULATING SYSTEMS FAILURES AND MALFUNCTIONS IN THE AEROPLANE DURING FLIGHT</p> <ul style="list-style-type: none"> <li>➤ SELECTION OF SAFE ALTITUDE</li> <li>➤ IMPORTANCE OF "TOUCH DRILLS"</li> <li>➤ SITUATIONAL AWARENESS</li> <li>➤ ADHERENCE TO CORRECT PROCEDURES</li> </ul> <p>TECHNIQUES OF APPLIED INSTRUCTION</p> <ul style="list-style-type: none"> <li>➤ THEORETICAL KNOWLEDGE – CLASSROOM INSTRUCTION TECHNIQUES</li> <li>➤ FLIGHTS – AIRBORNE INSTRUCTION TECHNIQUES</li> </ul> <p>PRESENTATION OF SUBJECT FROM STUDENT(S)</p>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>INSTRUMENT RATING INSTRUCTOR INITIAL TRAINING</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>18/24</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PART 1: TEACHING AND LEARNING TRAINING ADMINISTRATION</p> <ul style="list-style-type: none"> <li>➤ FLIGHT/THEORETICAL KNOWLEDGE INSTRUCTION RECORDS</li> <li>➤ PILOT'S PERSONAL FLYING LOG BOOK</li> <li>➤ THE FLIGHT/GROUND CURRICULUM</li> <li>➤ STUDY MATERIAL</li> <li>➤ OFFICIAL FORMS</li> <li>➤ AIRCRAFT FLIGHT/OWNER'S MANUAL/PILOT'S OPERATING HANDBOOKS</li> <li>➤ FLIGHT AUTHORISATION PAPERS</li> <li>➤ AIRCRAFT DOCUMENTS</li> <li>➤ THE PRIVATE PILOT'S LICENSE REGULATIONS</li> </ul> <p>TECHNIQUES OF APPLIED INSTRUCTION</p> <ul style="list-style-type: none"> <li>➤ THEORETICAL KNOWLEDGE – CLASSROOM INSTRUCTION TECHNIQUES</li> <li>➤ FLIGHTS – AIRBORNE INSTRUCTION TECHNIQUES</li> </ul> <p>PRESENTATION OF SUBJECT FROM STUDENT(S)</p>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>INSTRUMENT RATING INSTRUCTOR INITIAL TRAINING</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>19/24</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PART 2: INSTRUMENT RATING INSTRUCTOR THEORETICAL SYLLABUS</p> <p>PHYSIOLOGICAL/PSYCHOLOGICAL FACTORS</p> <ul style="list-style-type: none"> <li>➤ THE SENSES</li> <li>➤ SPATIAL DISORIENTATION</li> <li>➤ SENSORY ILLUSION</li> <li>➤ STRESS</li> </ul> <p>FLIGHT INSTRUMENTS</p> <ul style="list-style-type: none"> <li>➤ PRINCIPLES OF OPERATION</li> <li>➤ ERRORS AND IN-FLIGHT SERVICEABILITY CHECKS</li> <li>➤ SYSTEM FAILURES</li> </ul>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>INSTRUMENT RATING INSTRUCTOR INITIAL TRAINING</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>20/24</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PART 2: INSTRUMENT RATING INSTRUCTOR THEORETICAL SYLLABUS</p> <p>RADIO NAVIGATION AIDS</p> <ul style="list-style-type: none"> <li>➤ BASIC RADIO PRINCIPLES</li> <li>➤ BASIC PRINCIPLES OF RADIO AIDS</li> <li>➤ GROUND AND AEROPLANE EQUIPMENT</li> <li>➤ VOR, NDB/ADF, VHF/DF, RADAR, TRANSPONDERS, DME</li> <li>➤ OTHER NAVIGATIONAL SYSTEMS</li> <li>➤ PRE-FLIGHT SERVICEABILITY CHECKS</li> <li>➤ RANGE, ACCURACY AND LIMITATION OF EQUIPMENT</li> </ul>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>INSTRUMENT RATING INSTRUCTOR INITIAL TRAINING</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>21/24</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PART 2: INSTRUMENT RATING INSTRUCTOR THEORETICAL SYLLABUS</p> <p>AERONAUTICAL INFORMATION PUBLICATIONS</p> <ul style="list-style-type: none"> <li>➤ THE AERONAUTICAL INFORMATION PUBLICATION</li> <li>➤ THE RULES OF THE AIR AND AIR TRAFFIC SERVICES (RAC)</li> <li>➤ CLASSIFICATION OF AIRSPACE</li> <li>➤ HOLDING APPROACH TO LAND PROCEDURES</li> <li>➤ COMMUNICATIONS</li> <li>➤ CHARTS AVAILABLE</li> </ul> <p>BRIEFING FOR AIR EXERCISES PROGRESS</p>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>INSTRUMENT RATING INSTRUCTOR INITIAL TRAINING</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>22/24</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PART 2: INSTRUMENT RATING INSTRUCTOR THEORETICAL SYLLABUS</p> <p>FLIGHT PLANNING GENERAL</p> <ul style="list-style-type: none"> <li>➤ THE OBJECTIVES OF FLIGHT PLANNING</li> <li>➤ TELEPHONE OR ELECTRONIC DATA PROCESSING</li> <li>➤ QNH</li> <li>➤ ATC FREQUENCIES (VHF)</li> <li>➤ TOWER, APPROACH, EN-ROUTE, RADAR, FIS, ATIS AND WEATHER REPORTS</li> </ul> <p>BRIEFING FOR AIR EXERCISES PROGRESS</p>	



<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>INSTRUMENT RATING INSTRUCTOR INITIAL TRAINING</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>23/24</b>	TOTAL BREAK DURATION: 15 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PART 2: INSTRUMENT RATING INSTRUCTOR THEORETICAL SYLLABUS</p> <p>THE PRIVILEGES OF INSTRUMENT RATING</p> <ul style="list-style-type: none"> <li>➤ OUTSIDE CONTROLLED AIRSPACE</li> <li>➤ INSIDE CONTROLLED AIRSPACE</li> <li>➤ PERIOD OF VALIDITY AND RENEWAL PROCEDURES</li> </ul> <p>BRIEFING FOR AIR EXERCISES PROGRESS</p>	

**LECTURE DETAILS**

SUBJECT TITLE:		<b>INSTRUMENT RATING INSTRUCTOR INITIAL TRAINING</b>	
DURATION:	5 HOURS	BREAK DURATION:	5 MINS
LECTURE NUMBER:	<b>24/24</b>	TOTAL BREAK DURATION:	15 MINS

**CONTENTS & OBJECTIVES**

PART 2: INSTRUMENT RATING INSTRUCTOR THEORETICAL SYLLABUS  
BRIEFING FOR AIR EXERCISES PROGRESS  
  
FINAL PRESENTATION OF SUBJECT FROM STUDENT(S)

## **APPENDIX 7**

<b>SUBJECT DETAILS</b>	
<b>FLIGHT INSTRUCTOR RATING REFRESHER TRAINING</b>	
INSTRUCTIONAL HOURS:	<b>10</b>
NUMBER OF LECTURES:	<b>2</b>
LECTURE DURATION (WITHOUT BREAK):	<b>5</b>
NUMBER OF SAMPLE EXAMS (MINIMUM):	<b>1</b>
<b>GENERAL DESCRIPTION &amp; OBJECTIVES OF SUBJECT TRAINING</b>	
<ul style="list-style-type: none"><li>➤ PRINCIPLES OF LEARNING:</li><li>➤ BASIC LEVELS OF LEARNING:</li><li>➤ THE TEACHING PROCESS</li><li>➤ FLIGHT INSTRUCTOR CHARACTERISTICS &amp; RESPONSIBILITIES</li><li>➤ FLIGHT SAFETY &amp; ACCIDENT PREVENTION</li><li>➤ SYSTEMS &amp; EQUIPMENT MALFUNCTIONS</li></ul>	



**TRAINING MANUAL  
PART 4  
Theoretical Knowledge  
Instruction**

Page: 346  
Revision: 1  
Date: 6 Feb 2009

**INTENTIONALLY LEFT BLANK**

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>FLIGHT INSTRUCTOR RATING REFRESHER TRAINING</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>1/2</b>	TOTAL BREAK DURATION: 10 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>➤ PRINCIPLES OF LEARNING:</p> <ul style="list-style-type: none"> <li>✓ READINESS</li> <li>✓ EXERCISE</li> <li>✓ EFFECT</li> <li>✓ PRIMACY</li> <li>✓ INTENSITY</li> <li>✓ REGENCY</li> <li>✓ LEARNING CURVE</li> <li>✓ PERCEPTIONS FACTORS</li> <li>✓ PHYSICAL ORGANISM BASIC NEEDS</li> </ul> <p>GOALS &amp; VALUES, SELF-CONCEPT, TIME &amp; OPPORTUNITY, ELEMENT OF THREAT, INSIGHT, MOTIVATIONS.</p> <p>➤ BASIC LEVELS OF LEARNING:</p> <ul style="list-style-type: none"> <li>✓ CONTROL OF HUMAN BEHAVIOR</li> <li>✓ HUMAN NEEDS</li> <li>✓ PHYSICAL</li> <li>✓ SAFETY</li> <li>✓ SOCIAL</li> <li>✓ EGO</li> <li>✓ SELF-FULFILLMENT</li> <li>✓ DEFENSE MECHANISMS</li> </ul> <p>➤ REVIEW &amp; EVALUATION</p> <p>➤ CLASSROOM PRESENTATIONS</p>	

**LECTURE DETAILS**

SUBJECT TITLE:		<b>FLIGHT INSTRUCTOR RATING REFRESHER TRAINING</b>	
DURATION:	5 HOURS	BREAK DURATION:	5 MINS
LECTURE NUMBER:	<b>2/2</b>	TOTAL BREAK DURATION:	10 MINS

**CONTENTS & OBJECTIVES**

- THE TEACHING PROCESS
  - ✓ DESCRIPTION OF SKILL OR BEHAVIOR
  - ✓ CONDITIONS & CRITERIA
  - ✓ PERFORMANCE BASED OBJECTIVES
  - ✓ PRESENTATION & APPLICATION
  
- REVIEW & EVALUATION
  
- FLIGHT INSTRUCTOR CHARACTERISTICS & RESPONSIBILITIES
  - ✓ QUALIFICATIONS & PROFESSIONALISM
  - ✓ STRESS, ANXIETY & PSYCHOLOGICAL ABNORMALITIES OF THE STUDENT
  - ✓ STUDENT SUPERVISION & SURVEILLANCE
  - ✓ AUTHORITIES & RESPONSIBILITIES FOR ENDORSEMENTS & RECOMMENDATIONS
  
- FLIGHT SAFETY & ACCIDENT PREVENTION
  
- SYSTEMS & EQUIPMENT MALFUNCTIONS
  
- CLASSROOM PRESENTATIONS
  
- FINAL REVIEW & EVALUATION

**SUBJECT DETAILS**

**INSTRUMENT RATING INSTRUCTOR  
REFRESHER TRAINING**

INSTRUCTIONAL HOURS: **10**

NUMBER OF LECTURES: **2**

LECTURE DURATION (WITHOUT BREAK): **5**

NUMBER OF SAMPLE EXAMS (MINIMUM): **1**

**GENERAL DESCRIPTION &  
OBJECTIVES OF SUBJECT TRAINING**

- ✓ PRINCIPLES OF LEARNING:
- ✓ BASIC LEVELS OF LEARNING:
- ✓ THE TEACHING PROCESS
- ✓ FLIGHT INSTRUCTOR CHARACTERISTICS & RESPONSIBILITIES
- ✓ FLIGHT SAFETY & ACCIDENT PREVENTION
- ✓ SYSTEMS & EQUIPMENT MALFUNCTIONS
- ✓ PHYSIOLOGICAL/PSYCHOLOGICAL FACTORS
- ✓ FLIGHT INSTRUMENTS
- ✓ RADIO NAVIGATION AIDS
- ✓ AERONAUTICAL INFORMATION PUBLICATIONS
- ✓ FLIGHT PLANNING GENERAL
- ✓ THE PRIVILEGES OF INSTRUMENT RATING



**TRAINING MANUAL  
PART 4  
Theoretical Knowledge  
Instruction**

Page: 350  
Revision: 1  
Date: 6 Feb 2009

**INTENTIONALLY LEFT BLANK**



<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>INSTRUMENT RATING INSTRUCTOR REFRESHER TRAINING</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>1/2</b>	TOTAL BREAK DURATION: 10 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p><b>PRINCIPLES OF LEARNING:</b></p> <ul style="list-style-type: none"> <li>➤ READINESS</li> <li>➤ EXERCISE</li> <li>➤ EFFECT</li> <li>➤ PRIMACY</li> <li>➤ INTENSITY</li> <li>➤ REGENCY</li> <li>➤ LEARNING CURVE</li> <li>➤ PERCEPTIONS FACTORS</li> <li>➤ PHYSICAL ORGANISM BASIC NEEDS</li> </ul> <p><b>BASIC LEVELS OF LEARNING:</b></p> <ul style="list-style-type: none"> <li>➤ CONTROL OF HUMAN BEHAVIOR</li> <li>➤ HUMAN NEEDS</li> <li>➤ PHYSICAL</li> <li>➤ SAFETY</li> <li>➤ SOCIAL</li> <li>➤ EGO</li> <li>➤ SELF-FULFILLMENT</li> <li>➤ DEFENSE MECHANISMS</li> </ul> <p><b>THE TEACHING PROCESS</b></p> <ul style="list-style-type: none"> <li>➤ DESCRIPTION OF SKILL OR BEHAVIOR</li> <li>➤ CONDITIONS &amp; CRITERIA</li> <li>➤ PERFORMANCE BASED OBJECTIVES</li> <li>➤ PRESENTATION &amp; APPLICATION</li> </ul> <p><b>FLIGHT INSTRUCTOR CHARACTERISTICS &amp; RESPONSIBILITIES</b></p> <ul style="list-style-type: none"> <li>➤ QUALIFICATIONS &amp; PROFESSIONALISM</li> <li>➤ STRESS, ANXIETY &amp; PSYCHOLOGICAL ABNORMALITIES OF THE STUDENT</li> <li>➤ STUDENT SUPERVISION &amp; SURVEILLANCE</li> <li>➤ AUTHORITIES &amp; RESPONSIBILITIES FOR ENDORSEMENTS &amp; RECOMMENDATIONS</li> </ul> <p><b>FLIGHT SAFETY &amp; ACCIDENT PREVENTION</b></p> <p><b>SYSTEMS &amp; EQUIPMENT MALFUNCTIONS</b></p>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>INSTRUMENT RATING INSTRUCTOR REFRESHER TRAINING</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>2/2</b>	TOTAL BREAK DURATION: 10 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PHYSIOLOGICAL/PSYCHOLOGICAL FACTORS</p> <ul style="list-style-type: none"> <li>➤ THE SENSES</li> <li>➤ SPATIAL DISORIENTATION</li> <li>➤ SENSORY ILLUSION</li> <li>➤ STRESS</li> </ul> <p>FLIGHT INSTRUMENTS</p> <ul style="list-style-type: none"> <li>➤ PRINCIPLES OF OPERATION</li> <li>➤ ERRORS AND IN-FLIGHT SERVICEABILITY CHECKS</li> <li>➤ SYSTEM FAILURES</li> </ul> <p>RADIO NAVIGATION AIDS</p> <ul style="list-style-type: none"> <li>➤ BASIC RADIO PRINCIPLES</li> <li>➤ BASIC PRINCIPLES OF RADIO AIDS</li> <li>➤ GROUND AND AEROPLANE EQUIPMENT</li> <li>➤ VOR, NDB/ADF, VHF/DF, RADAR, TRANSPONDERS, DME</li> <li>➤ OTHER NAVIGATIONAL SYSTEMS</li> <li>➤ PRE-FLIGHT SERVICEABILITY CHECKS</li> <li>➤ RANGE, ACCURACY AND LIMITATION OF EQUIPMENT</li> </ul> <p>AERONAUTICAL INFORMATION PUBLICATIONS</p> <ul style="list-style-type: none"> <li>➤ THE AERONAUTICAL INFORMATION PUBLICATION</li> <li>➤ THE RULES OF THE AIR AND AIR TRAFFIC SERVICES (RAC)</li> <li>➤ CLASSIFICATION OF AIRSPACE</li> <li>➤ HOLDING APPROACH TO LAND PROCEDURES</li> <li>➤ COMMUNICATIONS</li> <li>➤ CHARTS AVAILABLE</li> </ul> <p>FLIGHT PLANNING GENERAL</p> <ul style="list-style-type: none"> <li>➤ THE OBJECTIVES OF FLIGHT PLANNING</li> <li>➤ TELEPHONE OR ELECTRONIC DATA PROCESSING</li> <li>➤ QNH</li> <li>➤ ATC FREQUENCIES (VHF)</li> <li>➤ TOWER, APPROACH, EN-ROUTE, RADAR, FIS, ATIS AND WEATHER REPORTS</li> </ul> <p>THE PRIVILEGES OF INSTRUMENT RATING</p> <ul style="list-style-type: none"> <li>➤ OUTSIDE CONTROLLED AIRSPACE</li> <li>➤ INSIDE CONTROLLED AIRSPACE</li> <li>➤ PERIOD OF VALIDITY AND RENEWAL PROCEDURES</li> </ul> <p>FINAL REVIEW &amp; EVALUATION</p>	

**SUBJECT DETAILS**

**CLASS RATING INSTRUCTOR  
REFRESHER TRAINING**

INSTRUCTIONAL HOURS:	<b>10</b>
NUMBER OF LECTURES:	<b>2</b>
LECTURE DURATION (WITHOUT BREAK):	<b>5</b>
NUMBER OF SAMPLE EXAMS (MINIMUM):	<b>1</b>

**GENERAL DESCRIPTION &  
OBJECTIVES OF SUBJECT TRAINING**

- ✓ PRINCIPLES OF LEARNING:
- ✓ BASIC LEVELS OF LEARNING:
- ✓ THE TEACHING PROCESS
- ✓ FLIGHT INSTRUCTOR CHARACTERISTICS & RESPONSIBILITIES
- ✓ FLIGHT SAFETY & ACCIDENT PREVENTION
- ✓ SYSTEMS & EQUIPMENT MALFUNCTIONS
- ✓ ASYMMETRIC POWER FLIGHT – PRINCIPLES OF FLIGHT
- ✓ CONTROL IN ASYMMETRIC POWER FLIGHT
- ✓ AEROPLANE PERFORMANCE-ONE ENGINE INOPERATIVE
- ✓ SPECIFIC AEROPLANE TYPE



**TRAINING MANUAL  
PART 4  
Theoretical Knowledge  
Instruction**

Page: 354  
Revision: 1  
Date: 6 Feb 2009

**INTENTIONALLY LEFT BLANK**

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>CLASS RATING INSTRUCTOR REFRESHER TRAINING</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>1/2</b>	TOTAL BREAK DURATION: 10 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p><b>PRINCIPLES OF LEARNING:</b></p> <ul style="list-style-type: none"> <li>➤ READINESS</li> <li>➤ EXERCISE</li> <li>➤ EFFECT</li> <li>➤ PRIMACY</li> <li>➤ INTENSITY</li> <li>➤ REGENCY</li> <li>➤ LEARNING CURVE</li> <li>➤ PERCEPTIONS FACTORS</li> <li>➤ PHYSICAL ORGANISM BASIC NEEDS</li> </ul> <p><b>BASIC LEVELS OF LEARNING:</b></p> <ul style="list-style-type: none"> <li>➤ CONTROL OF HUMAN BEHAVIOR</li> <li>➤ HUMAN NEEDS</li> <li>➤ PHYSICAL</li> <li>➤ SAFETY</li> <li>➤ SOCIAL</li> <li>➤ EGO</li> <li>➤ SELF-FULFILLMENT</li> <li>➤ DEFENSE MECHANISMS</li> </ul> <p><b>THE TEACHING PROCESS</b></p> <ul style="list-style-type: none"> <li>➤ DESCRIPTION OF SKILL OR BEHAVIOR</li> <li>➤ CONDITIONS &amp; CRITERIA</li> <li>➤ PERFORMANCE BASED OBJECTIVES</li> <li>➤ PRESENTATION &amp; APPLICATION</li> </ul> <p><b>FLIGHT INSTRUCTOR CHARACTERISTICS &amp; RESPONSIBILITIES</b></p> <ul style="list-style-type: none"> <li>➤ QUALIFICATIONS &amp; PROFESSIONALISM</li> <li>➤ STRESS, ANXIETY &amp; PSYCHOLOGICAL ABNORMALITIES OF THE STUDENT</li> <li>➤ STUDENT SUPERVISION &amp; SURVEILLANCE</li> <li>➤ AUTHORITIES &amp; RESPONSIBILITIES FOR ENDORSEMENTS &amp; RECOMMENDATIONS</li> </ul> <p><b>FLIGHT SAFETY &amp; ACCIDENT PREVENTION</b></p> <p><b>SYSTEMS &amp; EQUIPMENT MALFUNCTIONS</b></p>	

**LECTURE DETAILS**

SUBJECT TITLE:		<b>CLASS RATING INSTRUCTOR REFRESHER TRAINING</b>	
DURATION:	5 HOURS	BREAK DURATION:	5 MINS
LECTURE NUMBER:	<b>2/2</b>	TOTAL BREAK DURATION:	10 MINS

**CONTENTS & OBJECTIVES**

ASYMMETRIC POWER FLIGHT – PRINCIPLES OF FLIGHT

- THE PROBLEMS
- THE FORCES AND COUPLES

CONTROL IN ASYMMETRIC POWER FLIGHT

- USE, MISUSE AND LIMITS OF RUDDER, AILERON AND ELEVATORS
- EFFECT OF BANK/SIDESLIP/BALANCE
- DECREASE OF AILERON/RUDDER EFFECTIVENESS
- FIN STALL POSSIBILITY
- EFFECT OF IAS/THRUST RELATIONSHIP
- EFFECT OF RESIDUAL UNBALANCED FORCES
- FOOT LOADS AND TRIMMING
- MINIMUM CONTROL AND SAFETY SPEEDS

AEROPLANE PERFORMANCE-ONE ENGINE INOPERATIVE

- EFFECT ON EXCESS POWER AVAILABLE
- SINGLE-ENGINE CEILING
- CRUISING, RANGE AND ENDURANCE
- ACCELERATION/DECELERATION
- ZERO THRUST, DEFINITION AND PURPOSE
- PROPELLERS

SPECIFIC AEROPLANE TYPE

- AEROPLANE AND ENGINE SYSTEMS
- LIMITATIONS-AIRFRAME
- LIMITATIONS-ENGINE
- MASS AND BALANCE
- MASS AND PERFORMANCE

FINAL REVIEW & EVALUATION

## **APPENDIX 8**

### **SUBJECT DETAILS**

#### **INSTRUMENT RATING INSTRUCTOR REFRESHER TRAINING**

INSTRUCTIONAL HOURS:	<b>10</b>
NUMBER OF LECTURES:	<b>2</b>
LECTURE DURATION (WITHOUT BREAK):	<b>5</b>
NUMBER OF SAMPLE EXAMS (MINIMUM):	<b>1</b>

#### **GENERAL DESCRIPTION & OBJECTIVES OF SUBJECT TRAINING**

- ✓ PRINCIPLES OF LEARNING:
- ✓ BASIC LEVELS OF LEARNING:
- ✓ THE TEACHING PROCESS
- ✓ FLIGHT INSTRUCTOR CHARACTERISTICS & RESPONSIBILITIES
- ✓ FLIGHT SAFETY & ACCIDENT PREVENTION
- ✓ SYSTEMS & EQUIPMENT MALFUNCTIONS
- ✓ PHYSIOLOGICAL/PSYCHOLOGICAL FACTORS
- ✓ FLIGHT INSTRUMENTS
- ✓ RADIO NAVIGATION AIDS
- ✓ AERONAUTICAL INFORMATION PUBLICATIONS
- ✓ FLIGHT PLANNING GENERAL
- ✓ THE PRIVILEGES OF INSTRUMENT RATING



**TRAINING MANUAL  
PART 4  
Theoretical Knowledge  
Instruction**

Page: 358  
Revision: 1  
Date: 6 Feb 2009

**INTENTIONALLY LEFT BLANK**



<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>INSTRUMENT RATING INSTRUCTOR REFRESHER TRAINING</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>1/2</b>	TOTAL BREAK DURATION: 10 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p><b>PRINCIPLES OF LEARNING:</b></p> <ul style="list-style-type: none"> <li>➤ READINESS</li> <li>➤ EXERCISE</li> <li>➤ EFFECT</li> <li>➤ PRIMACY</li> <li>➤ INTENSITY</li> <li>➤ REGENCY</li> <li>➤ LEARNING CURVE</li> <li>➤ PERCEPTIONS FACTORS</li> <li>➤ PHYSICAL ORGANISM BASIC NEEDS</li> </ul> <p><b>BASIC LEVELS OF LEARNING:</b></p> <ul style="list-style-type: none"> <li>➤ CONTROL OF HUMAN BEHAVIOR</li> <li>➤ HUMAN NEEDS</li> <li>➤ PHYSICAL</li> <li>➤ SAFETY</li> <li>➤ SOCIAL</li> <li>➤ EGO</li> <li>➤ SELF-FULFILLMENT</li> <li>➤ DEFENSE MECHANISMS</li> </ul> <p><b>THE TEACHING PROCESS</b></p> <ul style="list-style-type: none"> <li>➤ DESCRIPTION OF SKILL OR BEHAVIOR</li> <li>➤ CONDITIONS &amp; CRITERIA</li> <li>➤ PERFORMANCE BASED OBJECTIVES</li> <li>➤ PRESENTATION &amp; APPLICATION</li> </ul> <p><b>FLIGHT INSTRUCTOR CHARACTERISTICS &amp; RESPONSIBILITIES</b></p> <ul style="list-style-type: none"> <li>➤ QUALIFICATIONS &amp; PROFESSIONALISM</li> <li>➤ STRESS, ANXIETY &amp; PSYCHOLOGICAL ABNORMALITIES OF THE STUDENT</li> <li>➤ STUDENT SUPERVISION &amp; SURVEILLANCE</li> <li>➤ AUTHORITIES &amp; RESPONSIBILITIES FOR ENDORSEMENTS &amp; RECOMMENDATIONS</li> </ul> <p><b>FLIGHT SAFETY &amp; ACCIDENT PREVENTION</b></p> <p><b>SYSTEMS &amp; EQUIPMENT MALFUNCTIONS</b></p>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>INSTRUMENT RATING INSTRUCTOR REFRESHER TRAINING</b>	
DURATION: 5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>2/2</b>	TOTAL BREAK DURATION: 10 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<p>PHYSIOLOGICAL/PSYCHOLOGICAL FACTORS</p> <ul style="list-style-type: none"> <li>➤ THE SENSES</li> <li>➤ SPATIAL DISORIENTATION</li> <li>➤ SENSORY ILLUSION</li> <li>➤ STRESS</li> </ul> <p>FLIGHT INSTRUMENTS</p> <ul style="list-style-type: none"> <li>➤ PRINCIPLES OF OPERATION</li> <li>➤ ERRORS AND IN-FLIGHT SERVICEABILITY CHECKS</li> <li>➤ SYSTEM FAILURES</li> </ul> <p>RADIO NAVIGATION AIDS</p> <ul style="list-style-type: none"> <li>➤ BASIC RADIO PRINCIPLES</li> <li>➤ BASIC PRINCIPLES OF RADIO AIDS</li> <li>➤ GROUND AND AEROPLANE EQUIPMENT</li> <li>➤ VOR, NDB/ADF, VHF/DF, RADAR, TRANSPONDERS, DME</li> <li>➤ OTHER NAVIGATIONAL SYSTEMS</li> <li>➤ PRE-FLIGHT SERVICEABILITY CHECKS</li> <li>➤ RANGE, ACCURACY AND LIMITATION OF EQUIPMENT</li> </ul> <p>AERONAUTICAL INFORMATION PUBLICATIONS</p> <ul style="list-style-type: none"> <li>➤ THE AERONAUTICAL INFORMATION PUBLICATION</li> <li>➤ THE RULES OF THE AIR AND AIR TRAFFIC SERVICES (RAC)</li> <li>➤ CLASSIFICATION OF AIRSPACE</li> <li>➤ HOLDING APPROACH TO LAND PROCEDURES</li> <li>➤ COMMUNICATIONS</li> <li>➤ CHARTS AVAILABLE</li> </ul> <p>FLIGHT PLANNING GENERAL</p> <ul style="list-style-type: none"> <li>➤ THE OBJECTIVES OF FLIGHT PLANNING</li> <li>➤ TELEPHONE OR ELECTRONIC DATA PROCESSING</li> <li>➤ QNH</li> <li>➤ ATC FREQUENCIES (VHF)</li> <li>➤ TOWER, APPROACH, EN-ROUTE, RADAR, FIS, ATIS AND WEATHER REPORTS</li> </ul> <p>THE PRIVILEGES OF INSTRUMENT RATING</p> <ul style="list-style-type: none"> <li>➤ OUTSIDE CONTROLLED AIRSPACE</li> <li>➤ INSIDE CONTROLLED AIRSPACE</li> <li>➤ PERIOD OF VALIDITY AND RENEWAL PROCEDURES</li> </ul> <p>FINAL REVIEW &amp; EVALUATION</p>	

## APPENDIX 9

<b>SUBJECT DETAILS</b>	
<b>MULTI ENGINE PISTON CLASS RATING REFRESHER TRAINING</b>	
INSTRUCTIONAL HOURS:	<b>5</b>
NUMBER OF LECTURES:	<b>2</b>
LECTURE DURATION (WITHOUT BREAK):	<b>2,5</b>
NUMBER OF SAMPLE EXAMS (MINIMUM):	<b>1</b>
<b>GENERAL DESCRIPTION &amp; OBJECTIVES OF SUBJECT TRAINING</b>	
<ul style="list-style-type: none"> <li>➤ PRINCIPLES OF FLIGHT-THE PROBLEMS</li> <li>➤ CONTROL IN ASYMMETRIC POWER FLIGHT</li> <li>➤ MINIMUM CONTROL AND SAFETY SPEEDS</li> <li>➤ AEROPLANE PERFORMANCE - ONE ENGINE INOPERATIVE</li> <li>➤ AIRCRAFT FAMILIARIZATION</li> <li>➤ EMERGENCY DRILLS</li> <li>➤ PRE-FLIGHT PREPARATION AND AEROPLANE INSPECTION</li> <li>➤ ENGINE STARTING PROCEDURES</li> <li>➤ PREPARATION FOR AND ACTION AFTER FLIGHT</li> </ul>	



**TRAINING MANUAL  
PART 4  
Theoretical Knowledge  
Instruction**

Page: 362  
Revision: 1  
Date: 6 Feb 2009

**INTENTIONALLY LEFT BLANK**

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>MULTI ENGINE PISTON CLASS RATING REFRESHER TRAINING</b>	
DURATION: 2,5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>1/2</b>	TOTAL BREAK DURATION: 10 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<ul style="list-style-type: none"> <li>➤ PRINCIPLES OF FLIGHT-THE PROBLEMS</li> <li>➤ CONTROL IN ASYMMETRIC POWER FLIGHT</li> <li>➤ MINIMUM CONTROL AND SAFETY SPEEDS</li> <li>➤ AEROPLANE PERFORMANCE - ONE ENGINE INOPERATIVE</li> </ul> <p>DURING THIS LESSON THE INSTRUCTOR WILL BRIEF THE STUDENTS ON MULTI-ENGINE AERODYNAMICS, OPERATING PROCEDURES, SYSTEMS, AND PERFORMANCE CONSIDERATIONS. THE APPLICANTS WILL LEARN TO ACCURATELY USE PERFORMANCE CHARTS AND COMPUTE WEIGHT AND BALANCE DATA TO CONTROL THE WEIGHT AND BALANCE CONDITIONS OF THE MULTI-ENGINE AIRPLANE. IN ADDITION THE STUDENTS WILL LEARN PRINCIPLES, TECHNIQUES, AND PROCEDURES WHICH APPLY TO ENGINE-OUT AND INSTRUMENT FLIGHT IN THE MULTI-ENGINE AIRPLANE.</p> <ul style="list-style-type: none"> <li>➤ MULTIENGINE PERFORMANCE CHARACTERISTICS</li> <li>➤ THE CRITICAL ENGINE</li> <li>➤ VMC FOR CERTIFICATION</li> <li>➤ PERFORMANCE</li> <li>➤ FACTORS IN TAKEOFF PLANNING</li> <li>➤ ACCELERATE/STOP DISTANCE</li> <li>➤ PROPELLER FEATHERING</li> <li>➤ USE OF TRIM TABS</li> <li>➤ PRE-FLIGHT PREPARATION</li> <li>➤ CHECKLIST</li> <li>➤ TAXIING</li> <li>➤ NORMAL TAKEOFFS</li> </ul>	

<b>LECTURE DETAILS</b>	
SUBJECT TITLE: <b>MULTI ENGINE PISTON CLASS RATING REFRESHER TRAINING</b>	
DURATION: 2,5 HOURS	BREAK DURATION: 5 MINS
LECTURE NUMBER: <b>2/2</b>	TOTAL BREAK DURATION: 10 MINS
<b>CONTENTS &amp; OBJECTIVES</b>	
<ul style="list-style-type: none"> <li>➤ AIRCRAFT FAMILIARIZATION</li> <li>➤ EMERGENCY DRILLS</li> <li>➤ PRE-FLIGHT PREPARATION AND AEROPLANE INSPECTION</li> <li>➤ ENGINE STARTING PROCEDURES</li> <li>➤ PREPARATION FOR AND ACTION AFTER FLIGHT</li> </ul> <p>TO FAMILIARIZE THE STUDENT WITH THE TRAINING AIRCRAFT, AND POST FLIGHT REQUIREMENTS INCLUDING LOGBOOK MAINTENANCE. ALSO TO FAMILIARIZE THE STUDENT WITH THE USE OF THE EMERGENCY CHECKLIST AND THE EMERGENCY EXITS AND EQUIPMENT ON BOARD THE AIRCRAFT</p> <p>REVIEW THE PRINCIPLES OF ASYMMETRIC FLIGHT AND ACTIONS FOLLOWING AN ENGINE FAILURE</p> <ul style="list-style-type: none"> <li>➤ CROSSWIND TAKEOFFS</li> <li>➤ SHORT-FIELD OR OBSTACLE CLEARANCE TAKEOFF</li> <li>➤ STALLS</li> <li>➤ EMERGENCY DESCENT</li> <li>➤ APPROACHES AND LANDINGS</li> <li>➤ CROSSWIND LANDINGS</li> <li>➤ SHORT-FIELD LANDING</li> <li>➤ GO-AROUND PROCEDURE</li> <li>➤ ENGINE INOPERATIVE EMERGENCIES</li> <li>➤ ENGINE INOPERATIVE PROCEDURES</li> <li>➤ VMC DEMONSTRATIONS</li> <li>➤ ENGINE FAILURE BEFORE LIFT-OFF (REJECTED TAKEOFF)</li> <li>➤ ENGINE FAILURE AFTER LIFT-OFF</li> <li>➤ ENGINE FAILURE EN ROUTE</li> <li>➤ ENGINE INOPERATIVE APPROACH AND LANDING</li> </ul>	