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DECLARED TRAINING ORGANISATION (DTO) TRAINING PROGRAM – HANG AND PARAGLIDING

NOTES:**DTO Training Programme and Syllabi**

141.08.13 A DTO training programme if not already contained in the applicable regulations and technical standards shall include at least the following information-

- (a) the aim of the course;
 - (b) crediting of previous experience and pre-entry requirements, including appropriate procedures for a student that wish to complete his or her training after having started at a different training organisation;
 - (c) a list of all air and FSTD exercises to be taught, including a description of the objective of each exercise;
 - (d) a syllabus summary if applicable;
 - (e) the structure and content of the theoretical knowledge instruction;
 - (f) the structure of the entire course and integration of theoretical knowledge instruction, FSTD and flight training; and
 - (g) student progress checks for theoretical knowledge and flight training, as appropriate.
1. This training program can be copied and included in the DTO Procedures Manual as Appendices.

APPENDIX A - PRACTICAL PARAGLIDING AND HANG -GLIDING EXERCISES

Theoretical training is delivered on an adhoc schedule based on weather conditions and student aptitude.

Ab Initio students will require training that incorporates both theoretical knowledge training and practical training covering the applicable parts of the syllabi over a minimum period of 7 days.

HOT and CFI may plan lessons at their discretion to cover the required aspects detailed under Appendix D of this DTO procedures manual.

	Only practical requirement for the specific endorsement shall be conducted – many exercises can be completed simultaneously or in one flight	
PRACTICAL EXERCISES		
EXERCISE	ITEM DESCRIPTION	HG&PG
	Note only apply applicable elements for non-powered	
EXERCISE 1	Familiarisation with the aircraft	✓
	characteristics of the HG PG or powered version thereof	
	systems	
	check lists, drills, controls	
EXERCISE 1E	Emergency drills	✓
	action in the event of fire on the ground and in the air	
	electrical system fire	
	escape drills, location and use of emergency equipment and exits	
EXERCISE 2	Preparation for and action after flight	✓
	equipment required, maps, etc.	

	external checks	
	internal checks	
	harness, seat adjustments	
	starting and warm up checks	
	power checks	
	running down system checks and switching off the engine	
	parking, security, and picketing (example tie downs)	
EXERCISE 3	Air experience	✓
	Flight exercise	
	introduce student to Aircraft Type Specific flight	
EXERCISE 4	Effects of controls	✓
	primary effects when laterally level and when banked	
	secondary effects	
	effects of:	
	airspeed	
	power	
	trimming controls	
	other controls, as applicable	
	operation of:	
	mixture control	
	airmanship	
EXERCISE 5	Taxiing	✓
	pre-taxi launch checks	
	starting, control of speed and stopping, including Taxi	
	engine handling	
	control of direction and turning	
	turning in confined spaces	
	effects of wind and use of flying controls, including wheel balancing	
	effects of ground surface	
	marshalling signals	
	instrument checks	
	airmanship	
	Ground handling / skimming flights / tethered flights / winching / power / engine prep (HG & PG)	
EXERCISE 5E	Emergencies	✓
	Brake and steering failure	
	Taxi Emergencies	
	Engine Emergencies	
EXERCISE 6	Straight and level	✓
	at normal cruising power, attaining and maintaining straight and level flight	
	flight at critically high airspeeds	
	demonstration of inherent stability, including recovering from PIO (Pilot Induced Oscillations)	
	altitude gliding and transition's, loose formation, gaggle (HG & PG flying in close proximity))	

	control in pitch, including use of trim	
	lateral level, direction and balance, trim	
EXERCISE 7	Climbing	✓
	entry, maintaining the normal and max rate climb, levelling off	
	levelling off at selected altitudes	
	maximum angle of climb	
EXERCISE 8	Descending	✓
	entry, maintaining and levelling off	
	levelling off at selected altitudes	
	glide, powered and cruise descent (including effect of power and airspeed)	
	use of instruments for precision flight	
EXERCISE 9	Turning	✓
	entry and maintaining medium level turns	
	resuming straight flight	
	faults in the turn – (in correct pitch, bank, balance), corrections (HG & PG)	
	climbing turns	
	descending turns	
EXERCISE 10A	Slow flight	✓
	safety checks	
	introduction to slow flight	
	application of full power with correct altitude and balance to achieve normal climb speed	
	Airspeed recognition / trim speed (HG & PG)	
	airmanship	
EXERCISE 10B	Stalling	✓
	airmanship	
	safety checks	
	symptoms	
	recognition	
	B line stall, Full stall and recovery without power and with power	
	recovery when a wing drops/ asymmetric/ front tuck	
	approach to stall in the approach and in the landing configurations, with and without power,	
	recovery at the incipient stage	✓
EXERCISE 11	Spin avoidance	
	airmanship	
	safety checks	
	stalling and recovery	
	Descending and Thermal Turns (HG & PG)	

EXERCISE 12	Take-off and climb to downwind position	✓
	pre-take-off checks	
	into wind take-off	
	safeguarding the nosewheel	
	crosswind take-off	
	crosswind	
	drills during and after take-off	
	short take-off and soft field procedure/techniques including performance calculations	
	noise abatement procedures	
	Launch, take-off, flare action (HG & PG)	
	Aerotow take off and climb to release (HG & PG)	
	Winch launches take off and climb to release (HG & PG)	
EXERCISE 13	Circuit, approach and landing	✓
	circuit procedures, downwind, base leg	
	powered approach and landing	
	safeguarding the nosewheel	
	effect of wind on approach and touchdown speeds	
	crosswind approach and landing	
	glide approach and landing	
	short landing and soft field procedures/techniques	
	wheel landing (tail wheel aeroplanes/gyroplanes)	
	missed approach/go around	
EXERCISE 12/13E	Emergencies	✓
	abandoned take-off	
	engine failure after take-off	
	engine shutdown and restarting in flight	
	Missed landing/go-around	
	missed approach	
EXERCISE 14	First solo	✓
	instructor's briefing, observation of flight and de-briefing	
	procedures for leaving and re-joining the circuit	
	the local area, restrictions, map reading	
EXERCISE 15	Advanced turning	✓
	steep turns (45°), level and descending	
	stalling in the turn and recovery	
	recoveries from unusual altitudes, including spiral dives	
EXERCISE 16	Forced landing without power	✓
	out or forced landing procedure, Big ears (symmetric wing tuck)	
	choice of landing area, provision for change of plan	
	gliding distance	
	descent plan	
	key positions	
	engine cooling	

	engine failure checks	
	use of radio	
	base leg	
	final approach (figure 8, S approach or aircraft approach)	
	landing	
	Forced landing with Power	
	actions after landing	
EXERCISE 17A	Low level flying	✓
	Safety considerations	
	Selection of the appropriate speed and configuration	
	Awareness of the danger factors and their recognition	
	Transition to low level flight	
	Control of speed and height	
	Following ground contours and line features	
	Ridge Soaring	
EXERCISE 17B	Precautionary landing	✓
	occasions necessitating	
	in-flight conditions	
	landing area selection	
	normal aerodrome	
	disused aerodrome	
	ordinary field	
	circuit and approach	
	actions after landing	
EXERCISE 18A	Navigation	✓
	Flight planning	✓
	weather forecast and actuals	
	map selection and preparation	
	choice of route	
	controlled airspace	
	danger, prohibited and restricted areas	
	safety altitudes	
	calculations	
	magnetic heading(s) and time(s) en-route	
	fuel consumption	
	mass and performance	
	flight information	
	NOTAMS etc.	
	radio frequencies	
	Departure	✓
	altimeter settings	
	maintenance of altitude and heading	
	log keeping	
	use of radio and variometer	

	minimum weather conditions for continuation of flight	
	in-flight decisions	
	lost procedure	
	entering the traffic pattern	
	circuit procedures	
	refuelling	
EXERCISE 18B	Navigation problems at lower levels and in reduced visibility	✓
	actions prior to descending	
	hazards (e.g., obstacles, and terrain)	
	effects of wind and turbulence (rotor, wind shadow)	
	vertical situational awareness (avoidance of controlled flight into terrain)	
	avoidance of noise sensitive areas	
	joining the circuit	
EXERCISE 18C	Navigation with GPS	✓

APPENDIX B - PILOT ENDORSEMENT THEORETICAL SYLLABI

Only theoretical requirements for the specific endorsement shall be conducted – not all elements documented are require each endorsement

	<u>HG Theory Subjects</u>		<u>PG Theory Subjects</u>
	Human performance limitations:		Human performance limitations:
1)	Introduction	1)	Introduction
2)	Hypoxia	2)	Hypoxia
3)	Hyperventilation	3)	Hyperventilation
4)	Air sickness	4)	Air sickness
5)	Epilepsy	5)	Epilepsy
6)	Alcohol and drugs	6)	Alcohol and drugs
7)	Disorientation	7)	Disorientation
8)	Management of stress	8)	Management of stress
9)	The ego factor	9)	The ego factor
10)	Intermediate syndrome	10)	Intermediate syndrome
	NOVICE ENDORSEMENT;		BASIC ENDORSEMENT;
1)	General Knowledge	1)	General Knowledge
2)	Basic air law	2)	Basic air law
3)	Basic meteorology	3)	Basic meteorology
4)	Flight and control	4)	Flight and control
5)	Hang-glider design and equipment	5)	Paraglider design and equipment
6)	Airflow	6)	Airflow
7)	Airmanship	7)	Airmanship
	CLASS A ENDORSEMENT		
1)	Meteorology		
2)	Airflow		
3)	Glider design and Hang-glider Structure		
4)	Flying skills and airmanship		
5)	General Knowledge and Air Law		
6)	Aerodynamics		
7)	Human Performance and medical		
8)	Navigation and Airspace		
	CLASS B ENDORSEMENT;		INTERMEDIATE ENDORSEMENT

1)	Meteorology and micro-meteorology	1)	Meteorology and micro-meteorology
2)	Equipment and flying skills	2)	Equipment and flying skills
3)	Hang-glider Design, Structure and Aerodynamics	3)	Paraglider Design, Structure and Aerodynamics
4)	Airmanship	4)	Airmanship
5)	Human Performance and medical	5)	Human Performance and medical
6)	Airspace and air law	6)	Airspace and air law
7)	Navigation and Airspace	7)	Navigation and Airspace
	CLASS C ENDORSEMENT		SPORT ENDORSEMENT
1)	General and South Africa legal aspects	1)	General and South Africa legal aspects
2)	Air law	2)	Air law
3)	Navigation and Airspace	3)	Navigation and Airspace
4)	Flying skills	4)	Flying skills
5)	Medical aspects of flying	5)	Medical aspects of flying
6)	Meteorology (Including advanced micro meteorology)	6)	Meteorology (Including advanced micro meteorology)
7)	Aero dynamics	7)	Aero dynamics
8)	Hang-glider design	8)	Paraglider design
9)	Human Performance and medical	9)	Human Performance and medical
	TANDEM ENDORSEMENT		TANDEM ENDORSEMENT
1)	Passenger Care:	1)	Passenger Care:
2)	Harness and comfort	2)	Harness and comfort
3)	Briefing	3)	Briefing
4)	Differences	4)	Differences
	POWERED ENDORSEMENT		POWERED ENDORSEMENT
1)	Engines – general	1)	Engines – general
2)	Ignition systems	2)	Ignition systems
3)	Carburetion and Fuel system	3)	Carburetion and Fuel system
4)	Fuel	4)	Fuel
5)	Electrical system	5)	Electrical system
6)	Propeller	6)	Propeller
7)	Undercarriages	7)	Undercarriages

	INSTRUMENTS:		INSTRUMENTS:
<u>1)</u>	Altimeter	1)	Altimeter
<u>2)</u>	Variometer, visual and audio	2)	Variometer, visual and audio
<u>3)</u>	GPS	3)	GPS
<u>4)</u>	Engine instruments	4)	Engine instruments
<u>5)</u>	Pressure altitude, density altitude	5)	Pressure altitude, density altitude

APPENDIX C - CATEGORY SYLLABUS ELEMENTS

	PARAGLIDER		HANG-GLIDER:
	GENERAL KNOWLEDGE		GENERAL KNOWLEDGE
<u>1</u>	Regulatory overview	1	Regulatory overview
<u>2</u>	Record keeping	2	Record keeping
<u>3</u>	Accidents and incidents	3	Accidents and incidents
<u>4</u>	License and endorsement structure	4	License and endorsement structure
<u>5</u>	Peer supervision sign-off systems/Observers	5	Peer supervision sign-off systems/Observers
<u>6</u>	Personal flying logbook	6	Personal flying logbook
	AIR LAW		AIR LAW
<u>1</u>	Introduction to relevant CARs	1	Introduction to relevant CARs
<u>2</u>	The need for flight patterns/right of way rules	2	The need for flight patterns/right of way rules
<u>3</u>	Right of way rules/principles	3	Right of way rules/principles
<u>4</u>	Situational awareness	4	Situational awareness
<u>5</u>	Site establishment and registration	5	Site establishment and registration
<u>6</u>	Ridge soaring etiquette	6	Ridge soaring etiquette
<u>7</u>	Thermalling etiquette	7	Thermalling etiquette
<u>8</u>	Airspace classification	8	Airspace classification
<u>9</u>	General flight rules	9	General flight rules
<u>10</u>	Visual flight rules	10	Visual flight rules
<u>11</u>	Incident/accident reporting	11	Incident/accident reporting
	BASIC METEOROLOGY		BASIC METEOROLOGY
<u>1</u>	Macro-meteorology overview	1	Macro-meteorology overview
<u>2</u>	Micro-meteorology overview	2	Micro-meteorology overview
<u>3</u>	Pressure, Density and Temperature	3	Pressure, Density and Temperature
<u>4</u>	Pressure and Wind	4	Pressure and Wind
<u>5</u>	Cloud Formation	5	Cloud Formation
<u>6</u>	Fog, Mist and Haze	6	Fog, Mist and Haze
<u>7</u>	Air Masses	7	Air Masses
<u>8</u>	Fronts	8	Fronts
<u>9</u>	Thunderstorms	9	Thunderstorms
<u>10</u>	Wind direction, strength, and topography	10	Wind direction, strength, and topography
<u>11</u>	Three primary causes of turbulence	11	Three primary causes of turbulence
<u>12</u>	Wind shadow and wind gradient	12	Wind shadow and wind gradient
<u>13</u>	Flight over Mountainous Areas	13	Flight over Mountainous Areas
<u>14</u>	Weather Analysis and Forecasting	14	Weather Analysis and Forecasting
<u>15</u>	Weather Information for Flight Planning	15	Weather Information for Flight Planning
	FLIGHT CONTROL		FLIGHT CONTROL
<u>1</u>	Wind speed and associated risks	1	Wind speed and associated risks
<u>2</u>	Strong wind precautions	2	Strong wind precautions
<u>3</u>	Stall recognition and recovery	3	Stall recognition and recovery
<u>4</u>	Wind speed, Airspeed, and groundspeed judgment	4	Wind speed, Airspeed, and groundspeed judgment
<u>5</u>	Polar curves, glide ratio, sink rate, wing loading	5	Polar curves, glide ratio, sink rate, wing loading
<u>6</u>	Speed to fly	6	Speed to fly
<u>7</u>	The effects of wing loading on handling and	7	The effects of wing loading on handling and

	performance		performance
	AERODYNAMICS		AERODYNAMICS
<u>1</u>	Three axis of flight – pitch, roll and yaw	1	Three axis of flight – pitch, roll and yaw
<u>2</u>	Definitions: Angle of attack, anhedral, dihedral, washout, sweepback, camber, reflex.	2	Definitions: Angle of attack, anhedral, dihedral, washout, sweepback, camber, reflex.
<u>3</u>	Stability features in pitch, roll, yaw	3	Stability features in pitch, roll, yaw
<u>4</u>	Airflow over wing and resultant forces (lift vector, resultant lift, drag, gravity and direction of flight)	4	Airflow over wing and resultant forces (lift vector, resultant lift, drag, gravity and direction of flight)
<u>5</u>	Aerofoils	5	Aerofoils
<u>6</u>	Thrust, Prop Torque effect	6	Thrust, Prop Torque effect
	PARAGLIDER DESIGN AND EQUIPMENT		HANG-GLIDER DESIGN AND EQUIPMENT
<u>1</u>	Harness types (pod, cocoon, stirrup,)	1	Harness types (knee-hangers, pod, cocoon, stirrup, supine and sup prone)
<u>2</u>	Disassembly and inspection of paraglider	2	Rogallo wing hazards
<u>3</u>	Tip steering	3	Modern hang-glider features – washout battens, sprogs, flutter sticks, variable billow/geometry, carbon fibre tubing
<u>4</u>	Motors	4	Disassembly and inspection of hang-glider
<u>5</u>	Wear and tear considerations	5	Motors
		6	Wear and tear considerations
	PRE-FLIGHT CHECK PRINCIPLES		PRE-FLIGHT CHECK PRINCIPLES
<u>1</u>	Glider, harness, helmet, weather, and pilot,	1	Glider, harness, helmet, weather and pilot, the 3 H's and the 5 LC's.
<u>2</u>	Effects of wing loading and hang point adjustments	2	Effects of wing loading and hang point adjustments
<u>3</u>	Pre- and in-flight checks	3	Pre- and in-flight checks
<u>4</u>	Reserve deployment	4	Reserve deployment
	AIRFLOW		AIRFLOW
<u>1</u>	Terrain and wind – The shape of the hill/mountain - rotor, compression, venturi, gradient, and wind shadow.	1	Terrain and wind – The shape of the hill/mountain - rotor, compression, venturi, gradient, and wind shadow.
<u>2</u>	Determinants of ridge lift	2	Determinants of ridge lift
<u>3</u>	Important safety considerations and precautions – identifying safe and danger areas for launch, in flight and landing	3	Important safety considerations and precautions – identifying safe and danger areas for launch, in flight and landing
	AIRMANSHIP		AIRMANSHIP
<u>1</u>	Contributing factors (knowledge, skill, experience, and pilot attitude - flying is more about attitude than altitude)	1	Contributing factors (knowledge, skill, experience, and pilot attitude - flying is more about attitude than altitude)
	PRINCIPLES OF FLIGHT		PRINCIPLES OF FLIGHT
<u>1</u>	Thermalling:	1	Thermalling:
	Introduction to thermals		Introduction to thermals
	Thermalling techniques.		Thermalling techniques.

	Rules in a thermal and right of way.		Rules in a thermal and right of way.
	Structure of a thermal and effects of prevailing wind and lapse rate.		Structure of a thermal and effects of prevailing wind and lapse rate.
<u>2</u>	Ridge Soaring:	2	Ridge Soaring:
	Introduction to ridge lift		Introduction to ridge lift
	Lift and pressure bands.		Lift and pressure bands.
	Ridge Rules and right of way.		Ridge Rules and right of way.
<u>3</u>	Cross Country flight:	3	Cross Country flight:
	Introduction to cross country flying		Introduction to cross country flying
<u>4</u>	Out landings and recovery.	4	Out landings and recovery.
<u>5</u>	Flight planning.	5	Flight planning.
	SIV		
<u>1</u>	Theory for the specific manoeuvre		
<u>2</u>	Emergencies		

APPENDIX D - INSTRUCTOR SYLLABUS

	HG INSTRUCTOR ENDORSEMENT:		PG INSTRUCTOR ENDORSEMENT
	Human performance limitations:		Human performance limitations:
1)	Introduction	1)	Introduction
2)	Hypoxia	2)	Hypoxia
3)	Hyperventilation	3)	Hyperventilation
4)	Air sickness	4)	Air sickness
5)	Epilepsy	5)	Epilepsy
6)	Vertigo	6)	Vertigo
7)	Disorientation	7)	Disorientation
8)	Anxiety	8)	Anxiety
9)	Fear	9)	Fear
10)	Psychological factors	10)	Psychological factors
11)	Shyness	11)	Shyness
12)	Management of stress	12)	Management of stress
13)	Fatigue	13)	Fatigue
14)	Drugs and alcohol	14)	Drugs and alcohol
15)	The authority & ego factor	15)	The authority & ego factor
16)	Intermediate syndrome	16)	Intermediate syndrome
17)	Primacy	17)	Primacy
18)	Other sports	18)	Other sports
19)	Previous injury	19)	Previous injury
	GENERAL INSTRUCTING FUNDAMENTALS		GENERAL INSTRUCTING FUNDAMENTALS
1)	Qualities of an instructor	1)	Qualities of an instructor
2)	Principles of learning	2)	Principles of learning
3)	The teaching process	3)	The teaching process
4)	Principles of teaching the sport of hang-gliding	4)	Principles of teaching the sport of paragliding
5)	Responsibilities of a Complete Instructor	5)	Responsibilities of a Complete Instructor
6)	Site selection	6)	Site selection
7)	Weather conditions suitable for training	7)	Weather conditions suitable for training
8)	Equipment	8)	Equipment
9)	Risk management	9)	Risk management
10)	Inability to follow directives	10)	Inability to follow directives
11)	Age and Sex related considerations	11)	Age and Sex related considerations
12)	Licensing, the observer and sign-off system	12)	Licensing, the observer and sign-off system
13)	Endorsement and License structure	13)	Endorsement and License structure
14)	Endorsement and License issuing procedure	14)	Endorsement and License issuing procedure

	GRADE C – HANG-GLIDING		GRADE C – PARAGLIDING TFI
1)	General Knowledge and Air Law	1)	General Knowledge and Air Law
2)	Hang-glider Structure and Aerodynamics	2)	Paraglider Structure and Aerodynamics
3)	Navigation and Airspace	3)	Navigation and Airspace
4)	Flying Skills and Airmanship	4)	Flying Skills and Airmanship
5)	Meteorology and Airflow	5)	Meteorology and Airflow
6)	Human factors and medical	6)	Human factors and medical
7)	Training methods	7)	Training methods
	GRADE B - HANG GLIDING;		GRADE B – PARAGLIDING;
	No additional theoretical training required for this endorsement; it is purely based on acquired experience.	1)	General Knowledge and Air Law
		2)	Paraglider Structure and Aerodynamics
		3)	Navigation and Airspace
		4)	Flying Skills and Airmanship
		5)	Meteorology and Airflow
		6)	Human Performance and medical
		7)	Training Methods/ launch methods
		8)	Proper attitude appropriate for the endorsement
	GRADE A - HANG GLIDING (INSTRUCTORS INSTRUCTOR)		GRADE A– PARAGLIDING (INSTRUCTORS INSTRUCTOR)
1)	ATO/ DTO regulations	1)	ATO/ DTO regulations
2)	Building Block training methodology	2)	Building Block training methodology
3)	Primacy	3)	Primacy
4)	Syllabi	4)	Syllabi
5)	Documentation	5)	Documentation
6)	Practical training	6)	Practical training

APPENDIX E - ITEMISED ELEMENTS OF SYLLABUS

Guidance for Theoretical knowledge areas that should be covered in training as applicable to the commensurate endorsement Note: If the theory has been completed at a lower endorsement in the theory training a refresher is conducted on the elements applicable		Novice/Basic	A	Intermediate /B	Sport /C	Tandem	TFI
	PHYSICS AND MECHANICS						
1	Speed, velocity, force	x			x		
2	Pressure – Bernoulli's Principle	x			x		
3	Motion of body along a curved path	x			x		
4	Aerofoil, lift and drag	x			x		
5	Air resistance and air density	x			x		
6	Aerofoil shapes	x			x		
7	Lift and drag – Angle of attack, Pitch and airspeed	x			x		
8	Distribution of lift, Centre of pressure	x			x		
9	Drag – Induced, parasite – Form, skin, interference	x			x		
10	Lift/drag ratio and aspect ratio	x			x		
11	Wake turbulence	x			x		
	EQUILIBRIUM						
1	The four forces: Lift, weight, gravity and drag	x			x		
2	Centre of gravity (C of G) position	x			x		
3	The balance of the four forces: Straight and level	x			x		
4	Climbing	x			x		
5	Descending	x			x		
	STABILITY						
1	Positive, neutral, negative	x			x		
2	Lateral and directional stability	x			x		
3	Longitudinal stability	x			x		
4	Pitch Yaw Roll	x			x		

5	Effects of power and the prop		x			x		
	PARAGLIDER OR HANG-GLIDER PERFORMANCE							
1	Polar curves		x			x		
2	Effect of temperature, altitude, density, moisture etc.		x			x		
3	Range and endurance		x			x		
4	Climbing performance		x			x		
5	Rate of climb		x			x		
6	Angle of climb		x			x		
7	best glide		x			x		
8	best rate of climb		x			x		
9	Take-off and landing performance		x			x		
10	Take-off run available		x			x		
11	Take-off distance available		x			x		
12	Landing distance available		x			x		
13	Take-off and initial climb - performance		x			x		
14	Effect of –		x			x		
	a	wind, wind gradient and wind shear	x			x		
	b	weight	x			x		
	c	pressure, altitude, temperature, and air density	x			x		
	d	ground surface and gradient	x			x		
	e	Approach and landing – performance	x			x		
	d	turbulence and gusts	x			x		
	e	ground effect	x			x		
	d	Rotor	x			x		
	e	Wind-shadow	x			x		
	PRINCIPLES OF FLIGHT							
	FLYING CONTROLS		x			x		

1	The three axes: Vertical, Lateral, Longitudinal Yaw, Pitch, Roll	x			x		
2	Operation and function of leading edge, Brakes, big ears, cravat line, tip steering	x			x		
3	Principles and purpose of mass and aerodynamic balance, Wing loading	x			x		
4	Operation and purpose of trimming controls if applicable	x			x		
5	Operation and function of Speed-bar	x			x		
6	Operation and function of the trimmers	x			x		
7	Operation and adjustment of harness and effect	x			x		
8	Turning	x			x		
9	Methods of Turning	x			x		
10	The forces in the turn	x			x		
11	Compensation for loss of lift	x			x		
	WEIGHT AND C OF G						
1	Limitations on Paraglider or hang-glider weight and effects	x			x		
2	Limitations in relation to Paraglider balance	x			x		
3	Weight and centre of gravity	x			x		
	THE SPIN						
1	Causes of a spin	x			x		
2	Rotation, Effect on harness and risers	x			x		
3	Effect of the C of G on spinning characteristics	x			x		
	THE STALL						
1	Airflow separation	x			x		
2	Stalling angle – Relationship to airspeed	x			x		
3	Wing loading	x			x		
4	Wing loading increase with bank angle increase	x			x		
5	High-speed stall	x			x		

	FLYING PERFORMANCE							
1	Use of brakes		x			x		
2	take off and initial climb performance		x			x		
3	Approach and landing stable approach		x			x		
4	Cross control		x			x		
5	Side slipping		x			x		
6	Stability		x			x		
7	Relationship of C of G to control in pitch		x			x		
8	Harness or undercarriage setup		x			x		
9	Wing loading, projected wing area and manoeuvres		x			x		
	a	Definition of wing loading and projected wing area	x			x		
	b	Effect on stalling speed	x			x		
	c	In-flight precautions	x			x		
			x			x		
	AIR LAW AND REGULATIONS							
1	Applicable acts, regulations, and other documents		x			x		
2	Structure and function of ANR's, CAR's, CAT's, AIP's, Notams, AIC's and AIP supplements.					x		
3	Classification of Paraglider or Hang-glider		x			x		
4	Paraglider or hang-glider documentation		x			x		
5	Paraglider or hang-glider equipment		x			x		
6	Paraglider or hang-glider radio equipment		x			x		
7	Paraglider or hang-glider weight schedule		x			x		
8	Documents and records to be maintained and produced on request		x			x		
9	Offences in relating to documents and records		x			x		
10	Airworthiness aspects		x			x		
11	Licensing or certification and endorsements		x			x		
12	Personal flying logbook and instructor's logbook		x			x		

13	Airspace classification	x			x		
14	General flight rules	x			x		
15	Visual flight rules and Visual metrological Conditions	x			x		
16	Special flight rules	x			x		
17	Flight operations	x			x		
18	General provisions	x			x		
19	Air traffic services	x			x		
20	Air-proximity reporting procedures	x			x		
21	Incident/accident reporting	x			x		
22	International operations and foreign pilots	x			x		
23	Operation of Non-type certified Paraglider or hang-glider and powered and wheeled version there of	x			x		
24	Proclaimed nature reserves	x			x		
	LOOSE FORMATION/ GAGGLE FLYING/DISPLAY/ AEROBATIC						
1	Law and regs				x		
2	Procedures and hazards				x		
	AVIATION METEOROLOGY						
1	THE ATMOSPHERE						
	a	Composition and structure	x		x	x	
	b	Vertical divisions	x		x	x	
2	PRESSURE, DENSITY AND TEMPERATURE						
	a	Barometric pressure, isobars			x	x	
	b	Changes of pressure, density, and temperature with altitude			x	x	
	c	Solar and terrestrial energy radiation, temperature			x	x	
	d	Lapse rate			x	x	
	e	Stability and instability			x	x	

	f	Effects of radiation, advection subsidence and convergence			x	x		
3	HUMIDITY AND PRECIPITATION							
	a	Water vapour in the atmosphere	x		x	x		
	b	Dew point and relative humidity	x		x	x		
4	PRESSURE AND WIND							
	a	High- and low-pressure areas	x		x	x		
	b	Gradient wind	x		x	x		
	c	Vertical and horizontal motion	x		x	x		
	d	Effect of wind gradient and wind shear on take-off and landing	x		x	x		
	e	Relationship between isobars and wind	x		x	x		
	f	Turbulence and Wind gusts	x		x	x		
	g	Local winds, land and sea breezes, berg winds, valley winds and visual wind speed guides	x		x	x		
5	CLOUD FORMATION							
	a	Cloud types	x		x	x		
	b	Convection clouds	x		x	x		
	c	Orographic clouds	x		x	x		
	d	Stratiform and cumulus clouds	x		x	x		
6	VISIBILITY							
	a	Fog, mist, and haze	x		x	x		
	b	Radiation, advection, frontal	x		x	x		
	c	Formation and dispersal	x		x	x		
	d	Reduction of visibility due to mist, snow, smoke, dust and sand	x		x	x		
	e	Hazards of flight due to low visibility, horizontal and vertical	x		x	x		
7	AIRMASSES							

	a	Weather associated with pressure systems	x		x	x		
8	FRONTS							
	a	Formation of cold and warm fronts	x		x	x		
	b	Associated clouds and weather, cold front	x		x	x		
9	THUNDERSTORMS							
	a	Formation – air masses, frontal, orographic	x		x	x		
	b	Conditions required	x		x	x		
	c	Development process	x		x	x		
	d	Recognition of favourable conditions for formation	x		x	x		
	e	Hazards	x		x	x		
	f	Effects of lightning and severe turbulence	x		x	x		
	g	Avoidance of flight in the vicinity of thunderstorms	x		x	x		
10	FLIGHT OVER MOUNTAINOUS AREAS							
	a	Hazards			x	x	x	
	b	Influence of terrain on atmospheric processes			x	x	x	
	c	Mountain waves, wind shear, turbulence, vertical movement, rotor effects			x	x	x	
11	CLIMATOLOGY							
	a	General world circulation	x		x	x		
	b	South African summer patterns	x		x	x		
	c	South African winter patterns	x		x	x		
	d	Berg winds	x		x	x		
12	ALTIMETRY							
	a	Operational aspects of pressure settings for variometers				x	x	
	b	Pressure altitude, density altitude				x	x	

	c	Height, altitude, flight level				x	x	
13	THE METEOROLOGICAL ORGANISATION							
	a	SAWS and other Forecasting services	x			x	x	
14	WEATHER ANALYSIS AND FORECASTING							
	a	Weather charts, symbols, signs	x	x	x	x		
	b	Significant weather charts	x	x	x	x		
	c	Prognostic charts for general aviation	x	x	x	x		
15	WEATHER INFORMATION FOR FLIGHT PLANNING							
	a	Reports and forecasts for departure, en-route, and destination	x			x	x	
	b	Interpretation of coded information METAR, TAF	x			x	x	
	c	Availability of ground reports for surface wind, wind shear, visibility	x			x	x	
16	METEOROLOGICAL BROADCASTS FOR AVIATION							
	a	ATIS, SIGMET	x	x	x	x		
17	MICRO-METEOROLOGY		x	x	x	x		
	a	Rotors	x	x	x	x		
	b	Venturi's	x	x	x	x		
	c	Katabatic and Anabatic winds	x	x	x	x		
	d	Thermal activity and thermal triggers.	x	x	x	x		
	e	Dust devils	x	x	x	x		
	f	The immediate environment.	x	x	x	x		
	g	Wind indicators	x	x	x	x		
	h	Cloud indicators	x	x	x	x		
		Paraglider Wing, Harnesses and Instruments						
1	PARAGLIDER /HANG-GLIDER -HARNESS and undercarriage etc							
	a	Structure	x					

	b	Materials	x					
	c	Wear and tear considerations/ maintenance	x					
	d	Repairs	x					
	e	Wing and harness or undercarriage assessment	x					
	f	UV	x					
	g	Turbulence	x					
	h	Hard and/ or drag landings	x					
	i	Connectors and reserves	x					
	j	Cleaning	x					
2	INSTRUMENTS							
	a	Airspeed indicator	x			x		
	b	Altimeter / variometer	x			x		
	c	Radio	x			x		
	d	Magnetic compass /	x			x		
	GENERAL NAVIGATION							
1	FORM OF THE EARTH		x			x		
	a	Axis, poles	x			x		
	b	Meridians of longitude	x			x		
	c	Parallels of latitude	x			x		
2	DIRECTION							
	a	True north	x			x		
	b	Earth's magnetic field, variation – annual change	x			x		
	c	Magnetic north	x			x		

	d	Magnetic influences	x			x		
	e	Compass deviation	x			x		
	f	Turning, acceleration errors	x			x		
	g	Avoiding magnetic interference with the compass/ Precautions when carrying magnetic objects	x			x		
3	DISTANCE AND SPEED							
	a	Nautical mile, statute mile, kilometre	x			x		
4	AERONAUTICAL MAPS AND CHARTS (TOPOGRAPHICAL)							
	a	Projections and their properties				x		
	b	Scale				x		
	c	1:250 000 and 1: 500 000 aviation navigation charts				x		
	d	Main properties				x		
	e	Depiction of height				x		
	f	Topography				x		
	g	Relief				x		
	h	Cultural features				x		
	i	Aeronautical symbols				x		
	j	Aeronautical information				x		
	k	Line features				x		
5	CHARTS IN PRACTICAL NAVIGATION							
	a	Plotting positions				x		
	b	Latitude and longitude				x		
	c	Bearing and distance				x		
	d	Measurement of tracks and distances				x		
	e	Conversion of units				x		

6	PRINCIPLES OF NAVIGATION							
	a	Track, true and magnetic				x		
	b	Wind velocity, heading and ground speed				x		
	c	Drift, wind correction angle				x		
	d	ETA				x		
	e	Dead reckoning, position				x		
7	FLIGHT PLANNING							
	a	Selection of charts				x		
	b	Route and aerodrome weather forecasts and reports				x		
	c	Assessing the weather situation				x		
	d	Plotting the route				x		
	e	Considerations of controlled airspace, airspace restrictions, danger areas, etc.				x		
	f	Use of AIP and NOTAMS				x		
	g	Safe altitude(s)				x		
	h	Alternate landings				x		
	i	Communications				x		
8	PRACTICAL NAVIGATION							
	a	Compass headings and deviation				x		
	b	Organisation of in-flight workload				x		
	c	Departure procedure				x		
	d	Maintenance of heading and altitude if flying under power				x		
	e	Use of visual observations				x		
	f	Establishing position, checkpoints				x		

	g	Revisions to heading and ETA				x		
	h	Flight following				x		
9	GLOBAL POSITIONING SYSTEM (GPS)							
	a	Limitations				x		
	b	Application				x		
	c	Principles				x		
	d	Presentation and interpretation				x		
	e	Coverage				x		
	f	Errors and accuracy				x		
	g	Factors affecting reliability and accuracy				x		
	h	Legalities				x		
10	HUMAN PERFORMANCE LIMITATIONS AND PASSENGER CARE							
	a	Introduction	x				x	
	b	Oxygen	x				x	
	c	Hypoxia	x				x	
	d	Hyperventilation	x				x	
	e	Barotraumas	x				x	
	f	Common ailments	x				x	
	g	Decompression	x				x	
	h	Air sickness	x				x	
	i	Hearing	x				x	
	j	Sight	x				x	
	k	Toxic hazards	x				x	
	l	Blood pressure	x				x	
	m	Epilepsy	x				x	
	n	Alcohol and drugs	x				x	
	o	Knowledge and the senses	x				x	

	p	Disorientation	x				x	
	q	Avoiding the air proximity	x				x	
	r	Stress	x				x	
	s	Management of stress	x				x	
	u	Emotional factors	x				x	
	v	Social psychology	x				x	
	w	The Ego Factor	x				x	
	x	Intermediate syndrome	x				x	
11	(11) PASSENGER CARE							
	a	Embarking / Disembarking (Clip In)					x	
	b	Harness straps and comfort					x	
	c	Briefing					x	
	d	Open harness flying					x	
	e	Clothing, long hair, helmet, and security					x	
	f	Cameras and loose articles					x	
	g	Human performance limitation as applicable to your passenger					x	
	h	Eye-contact, body contact and communication					x	
	i	Air law as applicable to passengers					x	
	j	Passenger seat and flying control access					x	
	k	Signing of indemnities					x	

