

**Private Pilot Licence Examinations – 020 Aircraft General Knowledge  
Aeroplane and Helicopter**

Syllabus Reference	Syllabus details & Associated Learning Objective	Aeroplane		Helicopter	
		PPL	Bridge Course	PPL	Bridge Course
<b>020.00.00.00</b>	<b>AIRCRAFT GENERAL KNOWLEDGE</b>				
021.00.00.00	<b>AIRFRAME AND SYSTEMS, ELECTRICS, POWERPLANT AND EMERGENCY EQUIPMENT</b>				
021.01.00.00	<b>System design, loads, stresses, maintenance</b>				
021.01.01.00	Loads and combination loadings applied to an aircraft's structure	x	x	x	x
021.02.00.00	<b>Airframe</b>				
021.02.01.00	<b>Wings, tail surfaces and control surfaces</b>				
021.02.01.01	Design and constructions	x	x		
021.02.01.02	Structural components and materials	x	x		
021.02.01.03	Stresses	x	x		
021.02.01.04	Structural limitations	x	x		
021.02.02.00	<b>Fuselage, doors, floor, wind-screen and windows</b>				
021.02.02.01	Design and constructions	x	x	x	x
021.02.02.02	Structural components and materials	x	x	x	x
021.02.02.03	Stresses	x	x	x	x
021.02.02.04	Structural limitations	x	x	x	x
021.02.03.00	<b>Flight and control surfaces</b>				
021.02.03.01	Design and constructions			x	x
021.02.03.02	Structural components and materials			x	x
021.02.03.03	Stresses and aero elastic vibrations			x	x
021.02.03.04	Structural limitations			x	x
	<b>Hydraulics</b>				
021.03.00.00	<b>Hydromechanics: basic principles</b>	x	x	x	x
021.03.01.00	<b>Hydraulic systems</b>	x	x	x	x
021.03.01.01	Hydraulic fluids: types and characteristics, limitations	x	x	x	x
021.03.01.02	System components: design, operation, degraded modes of operation, indications and warnings	x	x	x	x
021.04.00.00	<b>Landing gear, wheels, tyres and brakes</b>				
021.04.01.00	<b>Landing gear</b>				
021.04.01.01	Types and materials	x	x	x	x
021.04.02.00	<b>Nose wheel steering: design and operation</b>	x	x		
021.04.03.00	<b>Brakes</b>				
021.04.03.01	Types and materials	x	x	x	x
021.04.03.02	System components: design, operation, indications and warnings	x	x	x	x
021.04.04.00	<b>Wheels and tyres</b>				
021.04.04.01	Types and operational limitations	x	x	x	x
021.05.00.00	<b>Helicopter equipment</b>			x	x
021.06.00.00	<b>Flight controls</b>				
021.06.01.01	Mechanical or powered	x	x	x	x
021.06.01.02	Control systems and mechanical	x	x	x	x

021.06.01.03	System components: design, operation, indications and warnings, degraded modes of operation and jamming	x	x	x	x
021.06.02.00	<b>Secondary flight controls</b>				
021.06.02.01	System components: design, operation, degraded modes of operation, indications and warnings	x	x		
021.06.03.00	<b>Anti-icing systems</b>				
021.06.03.01	Types and operation (pitot and windshield)	x	x	x	x
021.07.00.00	<b>Fuel system</b>				
021.07.01.00	<b>Piston engine</b>				
021.07.01.01	System components: design, operation, degraded modes of operation, indications and warnings	x	x	x	x
021.07.02.00	<b>Turbine engine</b>				
021.07.02.01	System components: design, operation, degraded modes of operation, indications and warnings			x	x
021.08.00.00	<b>Electrics</b>				
021.08.01.00	<b>Electrics: general and definitions</b>				
021.08.01.01	Direct current: voltage, current, resistance, conductivity, Ohm's law, power and work	x	x	x	x
021.08.01.02	Alternating current: voltage, current, amplitude, phase, frequency and resistance	x	x	x	x
021.08.01.03	Circuits: series and parallel	x	x	x	x
021.08.01.04	Magnetic field: effects in an electrical circuit	x	x	x	x
021.08.02.00	<b>Batteries</b>				
021.08.02.01	Types, characteristics and limitations	x	x	x	x
021.08.02.02	Battery chargers, characteristics and limitations	x	x	x	x
021.08.03.00	<b>Static electricity: general</b>				
021.08.03.01	Basic principles	x	x	x	x
021.08.03.02	Static dischargers	x	x	x	x
021.08.03.03	Protection against interference	x	x	x	x
021.08.03.04	Lightning effects	x	x	x	x
021.08.04.00	<b>Generation: production, distribution and use</b>				
021.08.04.01	DC generation: types, design, operation, degraded modes of operation, indications and warnings	x	x	x	x
021.08.04.02	AC generation: types, design, operation, degraded modes of operation, indications and warnings	x	x	x	x
021.08.05.00	<b>Electric components</b>				
021.08.05.01	Basic elements: basic principles of switches, circuit-breakers and relays	x	x	x	x
021.08.06.00	<b>Distribution</b>				
021.08.06.01	General:	x	x	x	x
	(a) bus bar, common earth and priority;	x	x	x	x
	(b) AC and DC comparison.	x	x	x	x
021.09.00.00	<b>Piston engines</b>				
021.09.01.00	<b>General</b>				
021.09.01.01	Types of internal combustion engine: basic principles and definitions	x	x	x	x
021.09.01.02	Engine: design, operation, components and materials	x	x	x	x
021.09.02.00	<b>Fuel</b>				
021.09.02.01	Types, grades, characteristics and limitations	x	x	x	x
021.09.02.02	Alternate fuel: characteristics and limitations	x	x	x	x
021.09.03.00	<b>Carburettor or injection system</b>				
021.09.03.01	Carburettor: design, operation, degraded modes of operation, indications and warnings	x	x	x	x

021.09.03.02	Injection: design, operation, degraded modes of operation, indications and warnings	x	x	x	x
021.09.03.03	Icing	x	x	x	x
021.09.04.00	<b>Air cooling systems</b>				
021.09.04.01	Design, operation, degraded modes of operation, indications and warnings	x	x	x	x
021.09.05.00	<b>Lubrication systems</b>				
021.09.05.01	Lubricants: types, characteristics and limitations	x	x	x	x
021.09.05.02	Design, operation, degraded modes of operation, indications and warnings	x	x	x	x
021.09.06.00	<b>Ignition circuits</b>				
021.09.06.01	Design, operation, degraded modes of operation	x	x	x	x
021.09.07.00	<b>Mixture</b>				
021.09.07.01	Definition, characteristic mixtures, control instruments, associated control levers and indications	x	x	x	x
021.09.08.00	<b>Propellers</b>				
021.09.08.01	Definitions and general:	x	x		
	(a) aerodynamic parameters;	x	x		
	(b) types;	x	x		
	(c) operating modes.	x	x		
021.09.08.02	Constant speed propeller: design, operation and system components	x	x		
021.09.08.03	Propeller handling: associated control levers, degraded modes of operation, indications and warnings	x	x		
021.09.09.00	<b>Performance and engine handling</b>				
021.09.09.01	Performance: influence of engine parameters, influence of atmospheric conditions, limitations and power augmentation systems	x	x	x	x
021.09.09.02	Engine handling: power and mixture settings during various flight phases and operational limitations	x	x	x	x
021.10.00.00	<b>Turbine engines</b>				
021.10.01.00	<b>Definitions</b>			x	x
021.10.01.01	Coupled turbine engine: design, operation, components and materials			x	x
021.10.01.02	Free turbine engine: design, operation, components and materials			x	x
021.10.02.00	<b>Fuel</b>				
021.10.02.01	Types, characteristics and limitations			x	x
021.10.03.00	<b>Main engine components</b>				
021.10.03.01	Compressor:			x	x
	(a) types, design, operation, components and materials;			x	x
	(b) stresses and limitations;			x	x
	(c) stall, surge and means of prevention.			x	x
021.10.03.02	Combustion chamber:			x	x
	(a) types, design, operation, components and materials;			x	x
	(b) stresses and limitations;			x	x
	(c) emission problems.			x	x
021.10.03.03	Turbine:			x	x
	(a) types, design, operation, components and materials;			x	x
	(b) stresses, creep and limitations.			x	x
021.10.03.04	Exhaust:			x	x

	(a) design, operation and materials;			x	x
	(b) noise reduction.			x	x
021.10.03.05	Fuel control units: types, operation and sensors			x	x
021.10.03.06	Helicopter air intake: different types, design, operation, materials and optional equipments			x	x
021.10.04.00	<b>Additional components and systems</b>				
021.10.04.01	Helicopter additional components and systems: lubrication system, ignition circuit, starter, accessory gearbox, free wheel units: design, operation and components			x	x
021.10.05.00	<b>Performance aspects</b>				
021.10.05.01	Torque, performance aspects, engine handling and limitations:			x	x
	(a) engine ratings;			x	x
	(b) engine performance and limitations;			x	x
	(c) engine handling.			x	x
021.11.00.00	<b>Protection and detection systems</b>				
021.11.01.00	<b>Fire detection systems</b>				
021.11.01.01	Operation and indications			x	x
	<b>Helicopter: Miscellaneous systems</b>				
021.12.00.00	<b>Rotor design</b>			x	x
021.13.00.00	<b>Rotor heads</b>				
021.13.01.00	<b>Main rotor</b>				
021.13.01.01	Types			x	x
021.13.01.02	Structural components and materials, stresses and structural limitations			x	x
021.13.01.03	Design and construction			x	x
021.13.01.04	Adjustment			x	x
021.13.02.00	<b>Tail rotor</b>				
021.13.02.01	Types			x	x
021.13.02.02	Structural components and materials, stresses and structural limitations			x	x
021.13.02.03	Design and construction			x	x
021.13.02.04	Adjustment			x	x
021.14.00.00	<b>Transmission</b>				
021.14.01.00	<b>Main gear box</b>				
021.14.01.01	Different types, design, operation and limitations			x	x
021.14.02.00	<b>Rotor brake</b>				
021.14.02.01	Different types, design, operation and limitations			x	x
021.15.00.00	<b>Auxiliary systems</b>			x	x
021.16.00.00	<b>Drive shaft and associated installation</b>			x	x
021.16.01.00	<b>Intermediate and tail gear box</b>				
021.16.01.01	Different types, design, operation and limitations			x	x
021.17.00.00	<b>Blades</b>				
021.17.01.00	<b>Main rotor blade</b>				
021.17.01.01	Design and construction			x	x
021.17.01.02	Structural components and materials			x	x
021.17.01.03	Stresses			x	x
021.17.01.04	Structural limitations			x	x
021.17.01.05	Adjustment			x	x
021.17.01.06	Tip shape			x	x
021.17.02.00	<b>Tail rotor blade</b>				
021.17.02.01	Design and construction			x	x
021.17.02.02	Structural components and materials			x	x

021.17.02.03	Stresses			x	x
021.17.02.04	Structural limitations			x	x
021.17.02.05	Adjustment			x	x
<b>022.00.00.00</b>	<b>INSTRUMENTATION</b>				
022.01.00.00	<b>Instrument and indication systems</b>				
022.01.01.00	<b>Pressure gauge</b>				
022.01.01.01	Different types, design, operation, characteristics and accuracy	x	x	x	x
022.01.02.00	<b>Temperature sensing</b>				
022.01.02.01	Different types, design, operation, characteristics and accuracy	x	x	x	x
022.01.03.00	<b>Fuel gauge</b>				
022.01.03.01	Different types, design, operation, characteristics and accuracy	x	x	x	x
022.01.04.00	<b>Flow meter</b>				
022.01.04.01	Different types, design, operation, characteristics and accuracy	x	x	x	x
022.01.05.00	<b>Position transmitter</b>				
022.01.05.01	Different types, design, operation, characteristics and accuracy	x	x	x	x
022.01.06.00	<b>Torque meter</b>				
022.01.06.01	Design, operation, characteristics and accuracy			x	x
022.01.07.00	<b>Tachometer</b>				
022.01.07.01	Design, operation, characteristics and accuracy	x	x	x	x
022.02.00.00	<b>Measurement of aerodynamic parameters</b>				
022.02.01.00	<b>Pressure measurement</b>				
022.02.01.01	Static pressure, dynamic pressure, density and definitions	x	x	x	x
022.02.01.02	Design, operation, errors and accuracy	x	x	x	x
022.02.02.00	<b>Temperature measurement: aeroplane</b>				
022.02.02.01	Design, operation, errors and accuracy	x	x		
022.02.02.02	Displays	x	x		
022.02.03.00	<b>Temperature measurement: helicopter</b>				
022.02.03.01	Design, operation, errors and accuracy			x	x
022.02.03.02	Displays			x	x
022.02.04.00	<b>Altimeter</b>				
022.02.04.01	Standard atmosphere	x	x	x	x
022.02.04.02	The different barometric references (QNH, QFE and 1013.25)	x	x	x	x
022.02.04.03	Height, indicated altitude, true altitude, pressure altitude and density altitude	x	x	x	x
022.02.04.04	Design, operation, errors and accuracy	x	x	x	x
022.02.04.05	Displays	x	x	x	x
022.02.05.00	<b>Vertical speed indicator</b>				
022.02.05.01	Design, operation, errors and accuracy	x	x	x	x
022.02.05.02	Displays	x	x	x	x
022.02.06.00	<b>Air speed indicator</b>				
022.02.06.01	The different speeds IAS, CAS, TAS: definition, usage and relationships	x	x	x	x
022.02.06.02	Design, operation, errors and accuracy	x	x	x	x
022.02.06.03	Displays	x	x	x	x
	<b>Magnetism: direct reading compass</b>				
022.03.00.00	<b>Earth magnetic field</b>	x	x	x	x
022.03.01.00	<b>Direct reading compass</b>				
022.03.01.01	Design, operation, data processing, accuracy and deviation	x	x	x	x

022.03.01.02	Turning and acceleration errors	x	x	x	x
022.04.00.00	<b>Gyroscopic instruments</b>				
022.04.01.00	<b>Gyroscope: basic principles</b>				
022.04.01.01	Definitions and design	x	x	x	x
022.04.01.02	Fundamental properties	x	x	x	x
022.04.01.03	Drifts	x	x	x	x
022.04.02.00	<b>Turn and bank indicator</b>				
022.04.02.01	Design, operation and errors	x	x	x	x
022.04.03.00	<b>Attitude indicator</b>				
022.04.03.01	Design, operation, errors and accuracy	x	x	x	x
022.04.04.00	<b>Directional gyroscope</b>				
022.04.04.01	Design, operation, errors and accuracy	x	x	x	x
022.05.00.00	<b>Communication systems</b>				
022.05.01.00	<b>Transmission modes: VHF, HF and SATCOM</b>				
022.05.01.01	Principles, bandwidth, operational limitations and use	x	x	x	x
022.05.02.00	<b>Voice communication</b>				
022.05.02.01	Definitions, general and applications	x	x	x	x
022.06.00.00	<b>Alerting systems and proximity systems</b>				
022.06.01.00	<b>Flight warning systems</b>				
022.06.01.01	Design, operation, indications and alarms	x	x	x	x
022.06.02.00	<b>Stall warning</b>				
022.06.02.01	Design, operation, indications and alarms	x	x		
022.06.03.00	<b>Radio-altimeter</b>				
022.06.03.01	Design, operation, errors, accuracy and indications			x	x
022.06.04.00	<b>Rotor or engine over speed alert system</b>				
022.06.04.01	Design, operation, displays and alarms			x	x
022.07.00.00	<b>Integrated instruments: electronic displays</b>				
022.07.01.00	<b>Display units</b>				
022.07.01.01	Design, different technologies and limitations	x	x	x	x