

Toetsmatrijs PPL Human performance and limitations

In deze toetsmatrijs staat wat u moet kunnen en kennen. De toetsmatrijs vormt daarom de basis van de opleiding en het examen.

Opgesteld door:	CBR divisie CCV
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Categoriecode:	LVPAHPL (PPLA, LAPLA) en LVPHHPL (PPLH, LAPLH), LVOPLHPL en OPPL
Toetsvorm:	Digitaal
Totaal aantal vragen:	12 meerkeuzevragen
Cesuur:	75% (9 van de 12 vragen goed)
Bijzonderheden:	Alle leerdoelen die voor PPL(A/H) en LAPL(A/H) van toepassing zijn gelden ook voor OPPL

Nr	Eindtermen
040 00 00 00	HUMAN PERFORMANCE AND LIMITATIONS
040 01 00 00	Human factors: Basic concepts
040 02 00 00	Basics of aviation physiology and health maintenance
040 03 00 00	Basic aviation psychology

Vastgesteld door:	Technische Commissie Human performance and limitations
Beoordeeld door:	Logistiek, Transport en Personenvervoer raad; kamer 3: Luchtvaart <14 september 2018>
Goedgekeurd door:	Divisiemanager CCV <17 september 2018>
Ingangsdatum:	<1 april 2019>

Toelichting

Eindtermen: Dit zijn de hoofdonderwerpen die in het examen voorkomen. Hierin staat 'ruim' omschreven wat er in het examen terug kan komen.

Toetstermen: Dit zijn onderdelen van een eindterm. Hierin staat meer uitgebreid omschreven wat er in het examen terug kan komen.

Tax: Dit is de taxonomiecode van Romiszowski. Deze code geeft aan op welk niveau de vragen over een toetsterm gesteld worden.

F = Feitelijke kennis. De kandidaat kan feiten reproduceren (herkennen of herinneren).

B = Begripsmatige kennis. De kandidaat kan begrippen of principes omschrijven.

R = Reproductieve vaardigheden. De kandidaat kan acties uitvoeren die volgens een vastgelegde procedure verlopen.

P = Productieve vaardigheden. De kandidaat kan acties uitvoeren waarbij hij zijn eigen creativiteit en inzicht nodig heeft.

Eind- en toetstermen		Tax	PPLA	PPLH
040 00 00 00	HUMAN PERFORMANCE AND LIMITATIONS			
040 01 00 00	Human factors: Basic concepts			
040 01 01 00	Human factors in aviation			
040 01 01 01	<i>Becoming a competent pilot</i>			
(01)	State that competence is based on knowledge, skills and attitudes of an individual pilot.	F	X	X
040 01 04 00	Safety culture			
040 01 04 01	<i>Safety culture and safety management</i>			
(01)	Distinguish between 'open cultures' and 'closed cultures'.	B	X	X
(05)	State the important factors that promote a good safety culture.	F	X	X
(06)	Distinguish between 'just culture' and 'non-punitive culture'.	B	X	X
040 02 00 00	Basics of aviation physiology and health maintenance			
040 02 01 00	Basics of flight physiology			
040 02 01 01	<i>The Atmosphere</i>			
(01)	State that the volume percentage of the gases in ambient air will remain constant at all altitudes at which conventional aircraft operate.	F	X	X
(p01)	State the effects of increasing altitude on the partial oxygen pressure in the atmosphere.	F	X	X
(p02)	State and explain the importance of partial pressure.	F	X	X
040 02 01 02	<i>Respiratory and circulatory systems</i>			
(01)	List the main components of the respiratory system and their function.	F	X	X
(02)	Identify the different volumes of air in the lungs and state the normal respiratory rate.	B	X	X
(03)	Explain the role of carbon dioxide in the control and regulation of respiration.	B	X	X
(05)	List the factors that determine pulse rate.	F	X	X
(06)	Name the major components of the circulatory system and describe their function.	F	X	X

Eind- en toetstermen		Tax	PPLA	PPLH
(07)	State the values for a normal pulse rate and the average cardiac output (heart rate x stroke volume) of an adult at rest.	F	X	X
(08)	Define 'systolic' and 'diastolic' blood pressure.	F	X	X
(09)	State the normal blood pressure ranges and units of measurement.	F	X	X
(11)	Stress the function of haemoglobin in the circulatory system.	B	X	X
(12)	Define 'anaemia' and state its common causes,	F	X	X
(13)	Indicate the effect of increasing altitude on haemoglobin oxygen saturation.	R	X	X
	<i>Hypertension and Hypotension</i>			
(14)	Define 'hypertension' and 'hypotension'.	F	X	X
(15)	List the effects that high and low blood pressure will have on some normal functions of the human body.	F	X	X
(16)	State that both hypotension and hypertension may disqualify a pilot from obtaining medical clearance to fly.	F	X	X
(17)	List the factors which can lead to hypertension for an individual.	F	X	X
(18)	State the corrective actions that may be taken to reduce high blood pressure.	F	X	X
(19)	Stress that hypertension is the major factor of strokes in the general population.	F	X	X
	<i>Coronary artery disease</i>			
(21)	Explain the major risk factors for coronary disease.	B	X	X
(22)	State the role physical exercise plays in reducing the chances of developing coronary disease.	F	X	X
	<i>Hypoxia</i>			
(23)	Define the two major forms of hypoxia (hypoxic and anaemic) and the common causes of both.	F	X	X
(24)	State the symptoms of hypoxia.	F	X	X
(25)	State that healthy people are able to compensate for altitudes up to approximately 10 000 - 12 000 ft.	F	X	X
(27)	State the altitude at which short-term memory begins to be affected by hypoxia.	F	X	X
(30)	List the factors that determine the severity of hypoxia.	F	X	X
	<i>Hyperventilation</i>			

Eind- en toetstermen		Tax	PPLA	PPLH
(32)	Describe the role of carbon dioxide in hyperventilation.	B	X	X
(33)	Define the term 'hyperventilation'.	F	X	X
(34)	List the factors that cause hyperventilation.	F	X	X
(35)	State that hyperventilation may be caused by psychological or physiological reasons.	F	X	X
(36)	List the signs and symptoms of hyperventilation.	F	X	X
(37)	List the measures which may be taken to counteract hyperventilation: breath slowly, close one opening of the nose, speak loud, paper bag over nose and mouth.	F	X	X
	Acceleration			
(45)	Define 'linear acceleration' and 'angular acceleration'.	F	X	X
(46)	Describe the effects of z-acceleration on the circulation and blood volume distribution.	B	X	X
(47)	List magnitude, duration and onset as factors that determine the effects of acceleration on the human body.	F	X	X
	Carbon Monoxide			
(49)	State how carbon monoxide is produced.	F	X	X
(50)	State how the presence of carbon monoxide in the blood affects the distribution of oxygen.	F	X	X
(51)	List the signs and symptoms of carbon-monoxide poisoning.	F	X	X
(52)	Explain immediate countermeasures on suspicion of carbon-monoxide poisoning.	B	X	X
040 02 02 00	People and the environment: the sensory system			
040 02 02 01	The different senses			
(01)	List the different senses.	F	X	X
040 02 02 02	Central, peripheral and autonomic nervous systems			
(01)	Define the term 'sensory threshold'.	F	X	X
(02)	Define the term 'sensitivity', especially in the context of vision.	F	X	X
(03)	Give examples of sensory adaptation.	F	X	X
040 02 02 03	Vision			

Eind- en toetstermen		Tax	PPLA	PPLH
	Functional anatomy			
(02)	State the basic functions of the parts of the eye (cornea, lens, retina).	F	X	X
(03)	Define 'accommodation'.	F	X	X
(04)	Distinguish between the functions of the rod and cone cells.	B	X	X
(05)	Describe the distribution of rod and cone cells in the retina and explain their relevance to vision.	B	X	X
	The fovea (fovea centralis) and peripheral vision			
(06)	Explain the terms 'visual acuity', 'visual field', 'central vision', 'peripheral vision', 'the fovea', and explain their function in the process of vision.	B	X	X
(07)	List the factors that may degrade visual acuity and the importance of 'lookout'.	F	X	X
(08)	State the limitations of night vision and the different scanning techniques at both night and day.	F	X	X
(09)	State the time necessary for the eye to adapt both to bright light and the dark.	F	X	X
(10)	State the effect of hypoxia, smoking and altitude in excess of 5000 ft on night vision.	F	X	X
	Binocular and monocular vision			
(12)	Distinguish between monocular and binocular vision.	B	X	X
(13)	Explain the basis of depth perception and its relevance to flight performance.	B	X	X
(14)	List the possible monocular cues for depth perception.	F	X	X
	Defective vision			
(16)	Explain long-sightedness, short-sightedness and astigmatism.	B	X	X
(17)	List the causes of and the precautions that may be taken to reduce the probability of vision loss due to: - presbyopia; - cataracts; - glaucoma.	F	X	X
(18)	List the types of sunglasses that could cause perceptual problems in flight.	F	X	X
(20)	State the possible problems associated with contact lenses.	F	X	X

Eind- en toetstermen		Tax	PPLA	PPLH
(22)	Explain the significance of the 'blind spot' on the retina in detecting other traffic in flight.	B	X	X
040 02 02 04	Hearing			
	Descriptive and functional anatomy			
(01)	State the basic parts and functions of the outer, the middle and the inner ear.	F	X	X
(02)	Differentiate between the functions of the vestibular apparatus and the cochlea in the inner ear.	B	X	X
	Hearing loss			
(03)	Define the main causes of the following hearing defects/loss: - 'conductive deafness'; - 'noise induced hearing loss' (NIHL); - 'presbycusis'.	F	X	X
(04)	Summarise the effects of environmental noise on hearing.	B	X	X
(05)	State the decibel level of received noise that will cause NIHL.	F	X	X
(07)	List the main sources of hearing loss in the flying environment.	F	X	X
(08)	List the precautions that may be taken to reduce the probability of onset of hearing loss.	F	X	X
040 02 02 05	Equilibrium			
	Functional Anatomy			
(01)	List the main elements of the vestibular apparatus.	F	X	X
(02)	State the functions of the vestibular apparatus on the ground and in flight.	F	X	X
(03)	Distinguish between the component parts of the vestibular apparatus in the detection of linear and angular acceleration as well as on gravity.	B	X	X
	Motion sickness			
(05)	Describe air sickness and its accompanying symptoms.	B	X	X
(06)	List the causes of air sickness.	F	X	X
(08)	Describe the necessary actions to be taken to counteract the symptoms of air sickness.	B	X	X
040 02 02 06	Integration of sensory inputs			

Eind- en toetstermen		Tax	PPLA	PPLH
(01)	State the interaction between vision, equilibrium, proprioception and hearing to obtain spatial orientation in flight.	F	X	X
(02)	Define the term 'illusion'.	F	X	X
(03)	Give examples of visual illusions based on shape constancy, size constancy, aerial perspective, atmospheric perspective, the absence of focal or ambient cues, autokinesis, vectional false horizons and surface planes, and empty field myopia,	F	X	X
(04)	Relate these illusions to problems that may be experienced in flight and identify the danger attached to them.	B	X	X
(05)	List approach and landing illusions for slope of the runway, black-hole approach, and terrain around runway, and state the danger involved, with recommendations to avoid or counteract the problems with high or low approach or flare at the wrong time.	F	X	X
(06)	State the problems associated with flickering lights (strobe-lights, anti-collision lights, propellers and rotors under certain light conditions, etc.).	F	X	X
(07)	Describe vestibular illusions caused by the angular accelerations (the Leans, Coriolis) and linear accelerations (somatogravic, G-effect).	B	X	X
(08)	Relate the above-mentioned vestibular illusions to problems encountered in flight and state the dangers involved.	B	X	X
(09)	State that the 'seat-of-the-pants'sense' is completely unreliable when visual contact with the ground is lost or when flying in instrument meteorological conditions IMC or with a poor visual horizon,	F	X	X
(10)	Differentiate between vertigo, Coriolis effect and spatial disorientation.	B	X	X
(11)	List the measures to prevent or overcome spatial disorientation.	F	X	X
040 02 03 00	Health and hygiene			
040 02 03 02	Body rhythm and sleep			
(01)	Name some internal body rhythms and their relevance to sleep. Explain that the most important of which is body temperature.	F	X	X
(02)	Explain the term 'circadian rhythm'.	B	X	X
(08)	Explain the function of sleep and describe the effects of insufficient sleep on performance.	B	X	X
(15)	Describe the main effects of lack of sleep on an individual's performance.	B	X	X
040 02 03 03	Problem areas for pilots			
	Common Minor Ailments			
(01)	State the role of the Eustachian tube in equalizing pressure between the middle ear and the environment.	F	X	X
(02)	State that the in-flight environment may increase the severity of symptoms which may be minor while on the ground.	F	X	X

Eind- en toetstermen		Tax	PPLA	PPLH
(03)	List the negative effects of suffering from colds or flu on flight operations especially with regard to the middle ear, the sinuses, and the teeth.	F	X	X
(04)	State when a pilot should seek medical advice from an aeromedical examiner (AME) or aeromedical centre (AeMC).	F	X	X
(05)	Describe the measures to prevent or clear problems due to pressure changes during flight.	B	X	X
<i>Entrapped gases and barotrauma</i>				
(06)	Define 'barotrauma'.	F	X	X
(07)	Differentiate between otic, sinus, gastrointestinal and aerodontalgia (of the teeth) barotraumas and explain avoidance strategies.	B	X	X
(08)	Explain why the effects of otic barotrauma can be worse in the descent.	B	X	X
<i>Gastrointestinal upsets</i>				
(09)	State the effects of gastrointestinal upsets that may occur during flight.	F	X	X
(10)	List the precautions that should be observed to reduce the occurrence of gastrointestinal upsets.	F	X	X
(11)	Indicate the major sources of gastrointestinal upsets.	B	X	X
<i>Obesity</i>				
(12)	Define 'obesity'.	F	X	X
(13)	State the following harmful effects obesity can cause: - possibility of developing coronary problems; - increased chances of developing diabetes; - reduced ability to withstand G-forces; - general circulatory problems; - reduced ability to cope with hypoxia; - sleep apnoea.	F	X	X
<i>Food Hygiene</i>				
(16)	Stress the importance of and methods to be adopted by aircrew, especially when travelling abroad, to avoid contaminated food and liquids.	F	X	X
(19)	State the measure to avoid hypoglycaemia.	F	X	X

Eind- en toetstermen		Tax	PPLA	PPLH
(20)	State the importance of adequate hydration.	F	X	X
040 02 03 04	Intoxication			
	Tobacco			
(01)	State the harmful effects of tobacco on: - the respiratory system; - the cardiovascular system; - the ability to resist hypoxia; - the ability to withstand G-forces; - night vision.	F	X	X
	Caffeine			
(02)	Indicate the level of caffeine dosage at which performance is degraded.	F	X	X
(03)	Besides coffee, indicate other beverages containing caffeine.	F	X	X
	Alcohol			
(04)	State the maximum acceptable limit of alcohol for flight crew according to the applicable regulations.	F	X	X
(05)	State the effects of consuming alcohol on: - the ability to reason; - inhibitions and self-control; - vision; - the sense of balance and sensory illusions; - sleep patterns; - hypoxia.	F	X	X
(06)	State the effects alcohol may have if consumed together with other drugs.	F	X	X
(07)	List the signs and symptoms of alcoholism.	F	X	X
(09)	Define the 'unit' of alcohol and state approximate elimination rate from the blood.	F	X	X
(10)	State the maximum daily and weekly intake of units of alcohol which may be consumed without causing damage to organs and systems in the body	F	X	X
	Prescription and non-prescription drugs and self-medication			

Eind- en toetstermen		Tax	PPLA	PPLH
(12)	State the dangers associated with the use of non-prescription drugs.	F	X	X
(13)	State the side effects of common non-prescription drugs used to treat colds, flu, hay fever and other allergies, especially medicines containing antihistamine preparations.	F	X	X
(14)	Interpret the rules relevant to using (prescription or non-prescription) drugs that the pilot has not used before.	R	X	X
(15)	Interpret the general rule that 'if a pilot is so unwell that they require any medication, then they should consider themselves unfit to fly'.	R	X	X
040 03 00 00	Basic aviation psychology			
040 03 01 00	Human information processing			
040 03 01 01	Attention and vigilance			
(01)	Differentiate between 'attention' and 'vigilance'.	B	X	X
(02)	Differentiate between 'selected' and 'divided' attention.	B	X	X
(03)	Define 'hypovigilance'.	F	X	X
(04)	Identify the factors that may affect the state of vigilance.	B	X	X
(05)	List the factors that may forestall hypovigilance during flight.	F	X	X
(06)	Indicate the signs of reduced vigilance.	B	X	X
(07)	List the factors that affect a person's level of attention.	F	X	X
040 03 01 02	Perception			
(01)	Name the basis of the perceptual process.	F	X	X
(02)	Describe the mechanism of perception ('bottom-up'/'top down' process).	B	X	X
(03)	Illustrate why perception is subjective and state the relevant factors that influence interpretation of perceived information.	B	X	X
(04)	Describe some basic perceptual illusions.	B	X	X
(06)	Give examples where perception plays a decisive role in flight safety.	F	X	X
(07)	Stress how persuasive and believable mistaken perception can manifest itself both for an individual and a group.	B	X	X
040 03 01 03	Memory			

Eind- en toetstermen		Tax	PPLA	PPLH
(01)	Explain the link between the types of memory (to include sensory, working/short-term and long-term memory).	B	X	X
(02)	Describe the differences between the types of memory in terms of capacity and retention time.	B	X	X
(03)	Justify the importance of sensory-store memories in processing information.	B	X	X
(04)	State the average maximum number of separate items that may be held in working memory (5 ± 2).	F	X	X
(05)	Stress how interruption can affect the short-term/working memory.	B	X	X
(06)	Give examples of items that are important for pilots to hold in working memory during flight.	F	X	X
(07)	Describe how the capacity of the working-memory store may be increased.	B	X	X
(08)	State the subdivisions of long-term memory and give examples of their content.	F	X	X
(09)	Explain that skills are kept primarily in the long-term memory.	B	X	X
(11)	Name the common problems with both the long- and short-term memories and the best methods to try and counteract them.	F	X	X
040 03 02 00	Human error and reliability			
040 03 02 01	Reliability of human behaviour			
(01)	Name and explain factors that influence human reliability.	F	X	X
040 03 02 02	Mental models and situation awareness			
(01)	Define the term 'situation awareness'.	F	X	X
(02)	List the cues that indicate the loss of situation awareness and name the steps to regain it.	F	X	X
(03)	List the factors that influence one's situation awareness both positively and negatively, and stress the importance of situation awareness in the context of flight safety,	F	X	X
040 03 03 00	Decision making			
040 03 03 01	Decision-making concepts			
(01)	Define the term 'deciding' and 'decision making'.	F	X	X
(02)	Describe the major factors on which a decision-making should be based during the course of a flight.	B	X	X
(03)	Describe the main human attributes with regard to decision-making.	B	X	X
(04)	Discuss the nature of bias and its influence on the decision-making process.	B	X	X

Eind- en toetstermen		Tax	PPLA	PPLH
(05)	Describe the main error sources and limits in an individual's decision making mechanism.	B	X	X
(06)	State the factors upon which an individual's risk assessment is based.	F	X	X
(07)	Explain the relationship between risk assessment, commitment and pressure of time in decision making strategies.	B	X	X
(09)	Describe the positive and negative influences exerted by other group members on an individual's decision making process (risky shift).	B	X	X
040 03 04 00	Avoiding and managing errors: cockpit management			
040 03 04 01	Safety awareness			
(01)	Justify the need for being aware of not only one's own performance but that of others before and during a flight and the possible consequences or risks.	F	X	X
040 03 04 04	Communication			
(01)	Define the term 'communication'.	F	X	X
(05)	Name the importance of non-verbal communication.	F	X	X
(06)	Describe the general aspects of non-verbal communication.	B	X	X
040 03 05 00	Human behaviour			
040 03 05 01	Personality, attitude and behaviour			
(01)	Describe the factors that determine an individual's behaviour.	B	X	X
(02)	Define and distinguish between 'personality', 'attitude', and 'behaviour'.	F	X	X
(03)	State the origin of personality and attitude.	F	X	X
(04)	State that with behaviour good and bad habits can be formed.	F	X	X
(05)	Explain how behaviour is generally a product of personality, attitude and the environment to which one was exposed at significant moments (childhood, schooling and training).	B	X	X
040 03 05 03	Identification of hazardous attitudes (error proneness)			

Eind- en toetstermen		Tax	PPLA	PPLH
(01)	Explain dangerous attitudes in aviation: – anti-authority; – macho; – impulsivity; – invulnerability; – resignation.	B	X	X
040 03 06 00	Human overload and underload			
040 03 06 01	Arousal			
(01)	Explain the term 'arousal'.	B	X	X
(02)	Describe the relationship between arousal and performance.	B	X	X
(03)	Explain the circumstances under which underload may occur and its possible dangers.	B	X	X
040 03 06 02	Stress			
(01)	Explain the term 'stress' and why stress is a natural human reaction.	B	X	X
(02)	State that the physiological response to stress is generated by the 'fight or flight' response.	F	X	X
(05)	State the relationship between stress and performance.	F	X	X
(06)	State the basic categories of stressors.	F	X	X
(14)	Explain the relationship between stress and anxiety.	B	X	X
(16)	State the general effect of acute stress on people.	F	X	X
(19)	Explain the differences between psychological, psychosomatic and somatic stress reactions.	B	X	X
(20)	Name the typical common physiological and psychological symptoms of human overload.	F	X	X
(21)	Describe the effects of stress on human behaviour.	B	X	X
(22)	Explain how stress is cumulative and how stress from one situation can be transferred to a different situation.	B	X	X
(24)	Describe the effect of human underload/overload on effectiveness in the flight crew compartment.	B	X	X
040 03 06 05	Fatigue and stress management			

Eind- en toetstermen		Tax	PPLA	PPLH
(01)	Explain the term 'fatigue' and differentiate between the two types of fatigue (short-term and chronic fatigue).	B	X	X
(02)	Name the causes of short-term and chronic fatigue.	F	X	X
(03)	Identify the symptoms and describe the effects of fatigue.	B	X	X
(04)	List the strategies that prevent or delay the onset of fatigue and hypovigilance.	F	X	X
(05)	List and describe strategies for coping with stress factors and stress reactions.	F	X	X
(06)	Distinguish between short-term and long-term methods of stress management.	B	X	X
(07)	Give examples of short-term methods of stress management.	F	X	X
(08)	Give examples of long-term methods of coping with stress.	F	X	X
040 03 07 00	Advanced cockpit automation			
040 03 07 01	Advantages and disadvantages			
(p01)	Explain the advantages and disadvantages of the use of automated cockpit systems, including for instance GPS, tablet computers, or glass cockpits.	B	X	X
040 03 07 02	Automation complacency			
(04)	Describe 'complacency'.	B	X	X

Alleen de onderwerpen die als meest relevant voor privévliegers worden beschouwd zijn uitgewerkt in de leerdoelen. De onderwerpen die niet in de leerdoelen zijn uitgewerkt, maar wel terugkomen in de AMC-syllabus zijn in onderstaand tekstvak onder benoemd:

De volgende onderwerpen uit de AMC-syllabus zijn niet uitgewerkt in bovenstaande leerdoelen:

- **Personal hygiene:** personal fitness
- **Problem area for pilots:** (g) various toxic gases and materials

Wijzigingen toetsmatrijs LVPAHPL

Wijzigingen leerdoelen versie 26-02-2019 (t.o.v. versie 30-11-2012):

Algemene wijzigingen

- De leerdoelen zijn genummerd.
- De kolom met 'opmerkingen' is verwijderd. Alle informatie die (niet) geldt voor PPL staat (niet) in de LO's.

Grote wijzigingen

- 040 01 01 01: tweede LO is verwijderd.
- 040 02 01 01: eerste, tweede, vierde, vijfde, zesde en achtste LO zijn verwijderd.
- 040 02 01 02: derde, vierde, negende, tiende, dertiende en veertiende LO zijn verwijderd.
- 040 02 01 02 bij hypoxia: zesde en achtste LO zijn verwijderd.
- 040 02 01 02 bij hyperventilation: zesde LO is verwijderd.
- 040 02 01 02 bij acceleration: vierde en vijfde LO zijn verwijderd.
- 040 02 02 00 bij the different senses: tweede LO is verwijderd.
- 040 02 02 02 (was 040 02 02 01) bij central, peripheral and autonomic nervous systems: eerste en vijfde LO zijn verwijderd.
- 040 02 02 03 (was 040 02 02 02) bij functional anatomy: eerste LO is verwijderd.
- 040 02 02 03 (was 040 02 02 02) bij the fovea (fovea centralis) and peripheral vision (was visual foveal and peripheral vision): vierde en zevende LO zijn verwijderd.
- 040 02 02 03 (was 040 02 02 02) bij defective vision: leerdoel (22) toegevoegd.
- 040 02 02 04 (was 040 02 02 03) bij descriptive and functional anatomy: eerste, tweede, derde, vierde, zesde en zevende LO verwijderd.
- 040 02 02 04 (was 040 02 02 03) bij descriptive and functional anatomy: leerdoel (01) toegevoegd.
- 040 02 02 04 (was 040 02 02 03) bij hearing loss: vierde en vijfde LO zijn verwijderd.
- 040 02 02 05 (was 040 02 02 04) bij functional anatomy: vierde LO is verwijderd.
- 040 02 02 05 (was 040 02 02 04) bij motion sickness: derde LO is verwijderd.
- 040 02 02 06 (was 040 02 02 05): vijfde, zesde, achtste, tiende, elfde, veertiende en vijftiende LO zijn verwijderd.
- 040 02 02 06 (was 040 02 02 05): Leerdoel (05) en (07) toegevoegd.
- 040 02 03 00: onderdeel personal hygiene (040 02 03 01) verwijderd.
- 040 02 03 03 bij common minor ailments: vierde LO verwijderd.
- 040 02 03 03 bij obesity: derde LO verwijderd.
- 040 02 03 03 bij food hygiene: eerste en derde LO verwijderd. PPL: Nutrition and PPL: Various toxic gases and materials verwijderd.

- 040 02 03 04 'PPL: prescribed medication' verwijderd.
- 040 02 03 04: het kopje 'toxic materials' is verwijderd.
- 040 03 01 03: tiende LO is verwijderd.
- 040 03 01 04: dit hele onderdeel is verwijderd.
- 040 03 02 03: dit hele onderdeel is verwijderd.
- 040 03 03 01: negende LO is verwijderd.
- 040 03 04 01: tweede LO is verwijderd.
- 040 03 04 04: eerste, derde, vierde, vijfde, zesde, negende, tiende, elfde LO zijn verwijderd.
- 040 03 05 01: zesde LO is verwijderd.
- 040 03 05 03: LO aangepast in 'Explain dangerous attitudes in aviation (anti-authority; macho; impulsivity; invulnerability; resignation).
- 040 03 06 02: eerste, vierde, vijfde, zesde, negende, tiende, elfde, twaalfde, dertiende, veertiende, zestiende, achttiende, negentiende, twintigste, eenentwintigste, zesentwintigste en achtentwintigste LO zijn verwijderd.
- 040 03 06 05: Leerdoel (05), (06), (07) en (08) zijn toegevoegd.
- 040 03 07 00: Een tweede kopje (040 03 07 02 'Automation complacency' toegevoegd). De vijf oude LO's zijn vervangen door twee nieuwe LO's, waarvan één valt onder 040 03 07 01 en één onder 040 03 07 02.

Kleine wijzigingen

- De naam van het vak is gewijzigd van 'Human performance' naar 'Human performance and limitations'.
- Nummering van de leerdoelen toegevoegd.
- De kolom met 'opmerkingen' is verwijderd. Alle informatie die (niet) geldt voor PPL staat (niet) in de LO's.
- 040 02 01 01 (p01): aanpassing van 'State the effects of increasing altitude on the overall pressure and partial pressures of the various gases in the atmosphere' in 'State the effects of increasing altitude on the partial oxygen pressure in the atmosphere'.
- 040 02 01 02 bij hyperventilation (37) aanpassing van 'List measures which may be taken to counteract hyperventilation' naar 'List the measures which may be taken to counteract hyperventilation: breath slowly, close one opening of the nose, speak loud, paper bag over nose and mouth'.
- 040 02 01 02 bij acceleration (45) aanpassing van 'Define 'linear', 'angular' and 'radial acceleration' naar 'Define 'linear acceleration' and 'angular acceleration'.
- 040 02 01 02 bij acceleration (46) aanpassing van 'Describe the effects of acceleration on the circulation and blood volume distribution' naar 'Describe the effects of z-acceleration on the circulation and blood volume distribution.'
- 040 02 01 02 bij acceleration (47) aanpassing van 'List the factors determining the effects of acceleration on the human body' naar 'List magnitude, duration and onset as factors that determine the effects of acceleration on the human body.
- 040 02 01 02 bij carbon monoxide (52) aanpassing van 'Indicate how carbon monoxide poisoning can be treated and counter-measures that can be adopted' naar 'Explain immediate countermeasures on suspicion of carbon-monoxide poisoning'.
- 040 02 02 00: nieuw kopje 040 02 02 01 toegevoegd, waardoor alle andere kopjes één verspringen.
- 040 02 02 03 (was 040 02 02 02) bij the fovea (fovea centralis) and peripheral vision (10) aanpassing van 'State the effect of hypoxia and smoking on night vision' naar 'State the effect of hypoxia, smoking and altitude in excess of 5000 ft on night vision'.
- 040 02 03 04 bij alcohol (04): aanpassing van 'State the JAA maximum acceptable limit of alcohol for flight crew' naar 'State the maximum acceptable limit of alcohol for flight crew according to the applicable regulations'.
- 040 02 03 04 het kopje 'prescription and non-prescription drugs and self-medication' is vervangen door 'Drugs and self-medication'.
- 040 03 01 01 (07): 'name' is vervangen door 'list'.
- 040 03 04 04 (05): aanpassing van 'Name the functions of non-verbal communication' naar 'Name the importance of non-verbal communication'.
- 040 03 05 01 (05): aanpassing van 'Explain how behaviour is generally a product of personality and attitude' naar 'Explain how behaviour is generally a product of personality, attitude and the environment to which one was exposed at significant moments (childhood, schooling and training)'.