



Skedsmo videregående skole

NO.147.0002

Rev. dato: 25.09.2014

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Årsplan for faget: M12 HASS		Ref: Grunnleggende mål i læreplan for programfagene
	 Godkjent avdelingsleder

Læremidler som skal benyttes, Revisjons dato LTT filer: LTT rev. 2014 mai
Tillegg: LTT 12.3 September 2008

- Rotor og Helikopterlære,
- Lufthansa Training Pack
- Bilag: 12.7.1 Temperaturmåling i luftfartøy
- Utdrag fra EASA CS 29
- EASA part-CAT
- Internett
- MM til skolens helikopter
- Bilag: LTT 12.16

PART 66 referanse	Tema	Bok referanse	Ansvarlig lærer	Sign lærer Utført/dato
12.1 Level 2	<i>Theory of Flight – Rotary Wing Aerodynamics.</i> Terminology; Effects of gyroscopic precession; Torque reaction and directional control; Dissymmetry of lift, blade tip stall; Translating tendency and its correction; Coriolis effect and compensation; Vortex ring state, power settling, overpitching; Auto-rotation; Ground effect.	Rotor og Helikopterlære kap 1-2 og 4-8		



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12.2 Level 3	Flight control system. Cyclic control; Collective control, Swash plate; Yaw control: Anti-Torque control, Tail control, Bleed control Main rotor head: Design and operation features; Blade dampers: Function and construction; Rotor blades: Main and tail rotor blade Construction and attachment; Trim control, fixed and adjustable stabilisers; System operation: manual, hydraulic, electrical And fly-by-wire;	Lufthansa Training pack M12.02 s2-153 og 182-225		
12.2 Level 3	Flight Control Systems Rotor Blades: Main and tail rotor blade construction and attachment;	Lufthansa Training Pack M12.2_Flight Control Systems side 154-179		
12.3 Level 3	Blade tracking and vibration analysis. Rotor alignment; Main and tail rotor tracking; Static and dynamic balancing; Ground resonance.	Lufthansa Training pack M12.03 S 2-68 LTT M12.03 s 100-114		
12.3 Level 3	Vibration Vibration types, vibration reduction methods;	Lufthansa Training Pack M12.3_September 2008, Blade Tracking & Vibration Analysis side 32-49		
12.4 Level 3	Transmissions. Gear boxes, main and tail rotors; Clutches, free wheel units and rotor brake.	Lufthansa Training pack M12.04 s 2-116		



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<p>12.5a Level 2</p>	<p>Airframe structure; Airworthiness requirements for structural strength; Structural classification, primary, secondary and tertiary; Fail safe, safe life, damage tolerance concepts; Zonal and station identification systems; Stress, strain, bending, compression, shear, torsion, tension, hoop, stress, fatigue; Drains and ventilation provisions; system installation provisions; Lightning strike protection provision</p>	<p>Lufthansa Training Pack M12.5_Airframe Structures side 1-332 Bilag CS-29</p>		
<p>12.5b Level 2</p>	<p>Airframe structure; *Construction methods of: stressed skin fuselage, formers, stringers, longerons, bulkheads, frames, doublers, struts, ties, beams, floor structures, reinforcement, methods of skinning and anti-corrosive protection *Pylon, stabiliser and undercarriage attachments; *Seat installation *Doors, construction, mechanisms, operation and safety devices; Fuel storage Firewalls Engine mounts Structure assembly techniques; riveting, bolting, bonding Methods of surface protection, such as chromating, anodising, painting; Surface cleaning Airframe symmetry; methods of alignment and symmetry checks.</p>	<p>Lufthansa Training Pack M12.5_Airframe Structures side 1-332</p>		
<p>12.6 Level 2</p>	<p>Air Conditioning Cooling (Rep av Vapour cycle system) Air supply Cabin heating system Distribution</p>	<p>Lufthansa Training pack M12.06 s 2-46 og M11.04 PP Bilag</p>		



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<p>12.7.1 Level 2</p>	<p>Air Data Instruments</p> <p>Pitot – Static System</p> <p>Gyroscopes (ADI, HSI, Turn & Slip)</p> <p>Heading Reference System (Compass System)</p> <p>Temperature Indications</p> <p>Glass Cockpit (EIS Intro, EFIS & CWS)</p> <p>Vibration Monitoring</p> <p>Warning and Recording Systems (Altitude alert, Over speed, Stall, FDR)</p> <p>GPWS</p> <p>Fuel -quantity, -level sensing and -temperature</p>	<p>M11.05.01 pdf :8-47</p> <p>M11.05.01 pdf : 48-95</p> <p>M12.07 pdf : 132-165 M12.07 pdf: 178-195</p> <p>M12.07 pdf : 204-237</p> <p>M11.05.01 pdf : 46-47 M12.07 pdf: 43 B Temperaturmåling i luftfartøy</p> <p>M11.05.01 pdf : 208-219 M11.05.01 pdf : 278-371</p> <p>M12.7.1 pdf: 375-381</p> <p>M11.05.01 pdf : 96-111</p> <p>M11.05.01 pdf: 372-405</p> <p>M11.05.01 pdf : AF: 406-437</p>		
<p>12.7.2 Level 1</p>	<p>Communications Introduction</p> <p>Radio Comm (VHF, HF, ACARS, SATCOM, ELT)</p> <p>Audio Systems (Interphone, PA, CVR)</p> <p>Radio Navigation (ADF, VOR, ILS, MB)</p> <p>Radio Altimeter</p> <p>Distance Measuring Equipment DME</p> <p>Weather Radar</p> <p>ATC Transponder</p> <p>TCAS</p> <p>Autoflight (Autopilot, Flight Director)</p> <p>Auto Throttle System</p>	<p>M11.05.02 23 B1 E: 4-32</p> <p>M11.05.02 23 B1 E: 50-87</p> <p>M11.05.02 23 B1 E: 46-49</p> <p>M11.05.02 34 B1 E: 4-71</p> <p>M11.05.02 34 B1 E: 72-79</p> <p>M11.05.02 34 B1 E: 80-89</p> <p>M11.05.02 34 B1 E: 90-105</p> <p>M11.05.02 34 B1 E: 106-113</p> <p>M11.05.02 34 B1 E: 114-131</p> <p>M11.05.02 34 B1 E: 4-109</p> <p>M11.05.02 22 B1 E: 110-129</p>		



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12.8 Level 3	Electrical Power (ATA24) Batteries Installation and Operation DC power generation AC power generation Emergency power generation Voltage regulation Power distribution Inverters, transformers, rectifiers Circuit protection External/Ground power	LH 12.8 s.1 – 309 Bilag: EC Equirel Super Puma CBT+MM S-92 CBT Alouette III MM		
12.9 Level 2 Level 1	Equipment and furnishing. Seats, Harnesses and belts Lifting system; Emergency flotation system Cabin Layout	Lufthansa Training pack M12.09 s 2-92 og M11.07 Helikopter og Rotorlære kap 9 EASA part-CAT		
12.12 Level 3	Hydraulic Power (ATA 29) System Lay-out Hydraulic fluids Hydraulic reservoirs and accumulators Pressure generation: electric, mechanical, pneumatic Emergency pressure generation Pressure control Power distribution Indication and warning systems Interface with other systems	Lufthansa Training pack M12.12 s 2-397 og M 11.11		
12.16 Level 3	Pneumatic/Vacuum (ATA 36) System lay-out Sources: engine, compressor, reservoirs, ground supply Pressure control Distribution Indication and warnings Interface with other systems	Lufthansa modul 11.16 Lufthansa modul 12.16 s 2-43		
12.17 Level 2	INTEGRATED MODULAR AVIONICS (ATA 42) Network Fundamentals. Modularised Avionics warning Electronic Assembly (MAWEA). Airplane information Management System (AIMS) IMA A380.	LTT 12.17, s 1 - 51		



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12.18 Level 2	ON BOARD MAINTENANCE SYSTEMS (ATA 45) <i>Central Maintenance Computers. Data Loading System. Printing. Structural Monitoring System.</i>	LTT 11.18, s 2 - 113		
12.19 Level 2	INFORMATION SYSTEMS (ATA 46) <i>Air Traffic and Information systems. Flight Deck Information Systems. Aircraft and Cabin Information Network. Electronic Flight Bag.</i>	LTT 12.19, s 1 - 41		