

## ESTONIAN AVIATION ACADEMY

<b>I. GENERAL</b>	
COURSE CODE AND TITLE: (in English and Estonian)	TECH.004 Aircraft Construction (in English) <i>Õhusõiduki ehitus inglise keeles</i>
ACADEMIC YEAR, TERM, FORM OF STUDIES	2018/2019 Fall Semester, daytime studies
CURRICULUM, SPECIALITY AND MODULE WHERE THE SUBJECT BELONGS TO	Aircraft Engineering 3 <sup>rd</sup> year & visiting exchange students
SCOPE OF SUBJECT (ECTS)	4
FORM OF CONTROL	Non-graded examination
WORKLOAD AND FORMAT OF STUDIES	Contact hours: 52. Individual work (52 h) consists of: browsing/reviewing the class material OR reading new text OR preparing for presentation(s) – as the circumstances may require.
LANGUAGE OF INSTRUCTION	English
PREREQUISITES FOR ENROLMENT	Students willing to take this course are recommended to have completed the English Language courses at C1-B2/1 levels.
INSTRUCTOR(S)	Hans Kunka
<b>II. COURSE OBJECTIVES (WITH THEIR OVERT OUTCOMES) AND DESCRIPTION</b>	
COURSE OBJECTIVES (WITH THEIR OVERT OUTCOMES)	<ol style="list-style-type: none"> <li>(1) To enable students to study English, while studying about aircraft;</li> <li>(2) To encourage students to read authentic technical literature on Aircraft Engineering, thus building up their Aviation jargon, while also expanding their lexis in English, in general;</li> <li>(3) Through different formats of discussion to imaginarily “immerse” the students into conversations that they will, most likely, tackle in their internships at a MRO, and in their professional careers.</li> </ol>
COURSE DESCRIPTION (in brief)	<ol style="list-style-type: none"> <li>(1) Students’ ultimate goal in this course is to study the English used in Aircraft Engineering. They (are encouraged to) commit themselves to using English, both, as a language of working and of learning. To that end:</li> <li>(2) With the focus on studying the aircraft (terminology), the students also study verbal collocations, used in contemporary professional literature on airframes and power plants – with the objective to expand their lexis and command of English language structures at large;</li> <li>(3) Watching the documentary video(clip)s about structural elements of commercial aircrafts, the students improve their listening skills in English (by getting used to different paces of verbal presentation, and dialects) and, also, learn about aircraft visually and audibly.</li> <li>(4) Presentations made on aircraft-related topics are geared also to enable the students honing their social (group/audience) communication skills.</li> </ol>

<b>III. COURSE OUTLINE</b>	
<b>Week of</b>	<b>Topic</b>
Sep 3	Induction to the course. Aircraft airframe: fuselage, empennage, wings, flight control surfaces, lights; cockpit indication and control panels (Revision).
Sep 10	Power plant: Introduction, engine hazards, engine cowling (inlet cowl, fan cowl), thrust reverser, turbine exhaust, powered door opening system.
Sep 17	Engine pylon and attachment to the wing. Engine mounts, engine disconnects (left, right), bootstrap equipment, engine handling.
Sep 24	Engine general description; component location; spinners, fan blades and balance weights; engine separation; accessory drives
Oct 1	Ignition: general description; ignition component locations; igniters; ignition function description.
Oct 8	Engine controls: general description; component location; switches, thrust levers and auto-throttle assembly; engine controls operation.
Oct 15	Engine indicating: component location (left and right side); engine tachometer (N1 and N2 speed sensors) and indications; EGT general description; Airborne Vibration Monitoring (AVM)
Oct 22	Engine starting: general description; component location (in engine and flight compartment); engine starter (also: air valve and air pressure sensor); engine starting: functional description.
Oct 29	Engine air: general description; component location (left and right); turbine cooling: general description; variable bypass valve system; engine air: functional description.
Nov 5	Fuel storage; fuel tank arrangement, structure and access; tank vent system; pressure refuel: general description and operation, component locations; refuel station; integrated refuel panel; surge tank and float switch; refuel manifold valve;
Nov 12	Engine fuel feed: general description and component locations (at front spar and at rear spar); component locations at flight deck; fuel system pumps; water scavenge jet pump, fuel flow.
Nov 19	Engine fuel distribution: general description and component locations; main fuel pump; fuel supply manifolds and nozzles; fuel distribution: functional description; fuel and control: components and their locations; Electronic Engine Control and its functional description; fuel pressure sensors.
Nov 26	Engine oil: system general description; oil servicing; oil distribution – component locations; lube and scavenge pump; oil filter; main fuel-oil heat exchanger; debris monitoring system; oil distribution: general description; oil monitoring and pressure indicating.

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Dec 3	Main hydraulic system; component locations; hydraulic accumulators; hydraulic heat exchangers; system controls; left. Right and center system together with their functional descriptions; hydraulic system reservoirs; engine-driven pump; alternating current motor pump – with their functional descriptions; ram air turbine.
Dec 10	Air conditioning and airflow; air cooling; system components and their locations; water and waste system of commercial airplanes (case of Boeing 777-200/300)
Dec 17	Landing gear: general description; main landing gear and doors; side brace assembly; truck assembly; landing gear control system; component system and locations; retract actuator; wheel well; wheels and brakes with their hydro-mechanical control and flight deck components; antiskid autobrake system.  THE COURSE WRAPS UP!

### IV. COURSE TEXTS

PRIMARY:

- Aircraft Maintenance and Repair (7<sup>th</sup> edition) by M.J.Kroes, W.A.Watkins, F.Delp, R.Sterkenburg  
McGraw-Hill Publishers, 2013;
- Maintenance Practices for Aviation Maintenance, EASA Module 07a for Aircraft Maintenance. By Aircraft Technical Book Company, 2016
- (Lufthansa) Technical Training materials on BOEING 777-200/300 (yrs: 2013-2014-2015)

SUPPLEMENTARY:

- Technical Training materials on BOEING 777-200/300 (yrs: 2013-2014-2015)
- Aviation Maintenance Technician's Handbook, FAA, 2012.

### V. GRADING SYSTEM AND CRITERIA

GRADED COURSE ACTIVITIES	PERCENTAGE OF TOTAL 100%
Attendance and participation in classes	90%
Course Final Exam	10%