

# Study plan

## Name of study plan: Prospectus-Bachelor

Faculty/Institute/Others:

Department:

Branch of study guaranteed by the department: Welcome page

Garantor of the study branch:

Program of study: Welcome page

Type of study: unknown

Required credits: 5

Elective courses credits: -5

Sum of credits in the plan:

Note on the plan:

Name of the block: Volitelné p edm ty-odborné

Minimal number of credits of the block: 5

The role of the block: F

Code of the group: PRO-B-1

Name of the group: Courses that will be open if at least ten students are registered

Requirement credits in the group: In this group you have to gain at least 3 credits (at most 19)

Requirement courses in the group: In this group you have to complete at least 1 course

Credits in the group: 3

Note on the group:

Code of the group: PRO-B-O

Name of the group: Courses that will certainly be open

Requirement credits in the group: In this group you have to gain at least 2 credits (at most 18)

Requirement courses in the group: In this group you have to complete at least 1 course

Credits in the group: 2

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
21LTP1-E	<b>Air Law 1</b> Radoslav Zozuák	KZ	3	3P+0C	L	F
21EKL-E	<b>Air Transport Economy</b> Peter Vittek	Z,ZK	3	2P+1C	Z	F
21LPTY-E	<b>Aircraft Operations</b> Ladislav Capoušek Ladislav Capoušek	ZK	2	2P+0C	Z	F
21VL-E	<b>Aircraft Performance</b> Denisa Svobodová Denisa Svobodová	Z,ZK	4	2P+2C	Z	F
21LDA1-E	<b>Aircraft 1</b> Max Chopart	Z,ZK	3	2P+1C	L	F
21LTA2-E	<b>Aircraft 2</b> Max Chopart Max Chopart	Z,ZK	2	2P+1C	Z	F
14ASD	<b>Algorithm and Data Structures</b> Vít Fábera, Tomáš Brandejský, Michal Jeábek, Marek Kalika, Zdeněk Lokaj, Alena Plašilová, Jan Procházka, Martin Šrotý, Jana Kaliková, .....	KZ	3	0P+2C+8B	Z	F
21APL1-E	<b>Aviation English 1 for Professional Pilot</b> Max Chopart Max Chopart	Z	3	0P+4C	Z	F
21APL2-E	<b>Aviation English 2 for Professional Pilot</b>	Z,ZK	3	0P+4C	L	F
11CAL1-E	<b>Calculus 1</b> Magdalena Hykšová, Ondřej Navrátil, Oldřich Hykš, Tomáš Tásák, Olga Vraštilová Magdalena Hykšová Magdalena Hykšová (Gar.)	Z,ZK	7	2P+4C+2B	Z	F
11CAL2-E	<b>Calculus 2</b> Magdalena Hykšová	Z,ZK	5	2P+3C	L	F
15JZ1A	<b>Foreign Language - English 1</b> Markéta Vojanová, Jiřka Hejmanová, Marek Tomeček, Marie Michlová, Lenka Monková, Markéta Olehlová, Peter Morpuss, Jan Feit, Eva Rezlerová	Z	3	0P+4C+10B		F

15JZ2A	<b>Foreign Language - English 2</b>	Z,ZK	3	0P+4C+10B		F
15JZ3F	<b>Foreign Language - French 3</b> <i>Eva Rezlerová, Irena Veselková</i>	Z	3	0P+4C+10B	Z	F
15JZ4F	<b>Foreign Language - French 4</b>	Z,ZK	3	0P+4C+10B	L	F
15JZ3I	<b>Foreign Language - Italian 3</b>	Z	3	0P+4C+10B	Z	F
15JZ4I	<b>Foreign Language - Italian 4</b>	Z,ZK	3	0P+4C+10B	L	F
15JZ3N	<b>Foreign Language - German 3</b> <i>Eva Rezlerová, Jana Štíkarová</i>	Z	3	0P+4C+10B	Z	F
15JZ4N	<b>Foreign Language - German 4</b>	Z,ZK	3	0P+4C+10B	L	F
15JZ3R	<b>Foreign Language - Russian 3</b> <i>Marie Michlová, Eva Rezlerová</i>	Z	3	0P+4C+10B	Z	F
15JZ4R	<b>Foreign Language - Russian 4</b>	Z,ZK	3	0P+4C+10B	L	F
15JZ3S	<b>Foreign Language - Spanish 3</b> <i>Eva Rezlerová, Nina Hrcisina Puškinová</i>	Z	3	0P+4C+10B	Z	F
15JZ4S	<b>Foreign Language - Spanish 4</b>	Z,ZK	3	0P+4C+10B	L	F
21DKL	<b>Aviation Data Link Communication</b>	KZ	3	2P+1C	L	F
15DPLG	<b>Transportation Psychology</b> <i>Eva Rezlerová, Jana Štíkarová</i>	Z	2	2P+0C+6B	Z	F
11EMO-E	<b>Electromagnetic Field and Optics</b>	Z,ZK	4	2P+1C	L	F
21EBLP	<b>European Air Transport Safety Attitude</b>	Z,ZK	4	2P+2C	L	F
21PML-E	<b>Flight Planning and Monitoring</b>	Z,ZK	3	2P+2C	L	F
21OBN-E	<b>General Navigation</b> <i>Denisa Svobodová Denisa Svobodová</i>	ZK	5	4P+0C	Z	F
11GIE-E	<b>Geometry</b> <i>Šárka Vorá ová Šárka Vorá ová Šárka Vorá ová (Gar.)</i>	KZ	3	2P+2C+12B	Z	F
21LCLT-E	<b>Human Factors in Aviation</b>	ZK	3	3P+0C	L	F
21PRJ1-E	<b>Instrumentation 1</b> <i>Martin Vecko</i>	ZK	2	2P+0C	L	F
21PRJ2-E	<b>Instrumentation 2</b> <i>Martin Vecko Martin Vecko</i>	ZK	3	2P+0C	Z	F
14KSP	<b>Constructing with Computer Aid</b> <i>Lukáš Svoboda, Drahomír Schmidt, Martin Brumovský, Radek Kratochvíl, Vladimír Douša, Michal Mlada, Jan Vogl, Jan Zelenka</i>	KZ	2	0P+2C+8B	Z	F
21LGPS	<b>Legislation and Operational Regulations</b> <i>Radoslav Zozuák Radoslav Zozuák</i>	Z,ZK	8	4P+2C	Z	F
21LAG1	<b>English for Aviation 1</b> <i>Tereza Dvo áková Tereza Dvo áková</i>	KZ	3	0P+2C	Z	F
21LAG2	<b>English for Aviation 1</b>	KZ	3	0P+2C+10B	L	F
21LCM	<b>Aircraft Engines</b> <i>Denisa Svobodová, Daniel Hanus, Tomáš Parýzek Daniel Hanus</i>	Z,ZK	3	2P+1C	Z	F
21LTTE	<b>Aerodromes</b> <i>Ladislav Capoušek</i>	Z,ZK	4	2P+1C+12B	L	F
11LA-E	<b>Linear Algebra</b> <i>Martina Be vá ová Martina Be vá ová Martina Be vá ová (Gar.)</i>	Z,ZK	3	2P+1C+10B	Z	F
18MTY	<b>Materials Science and Engineering</b> <i>Jaroslav Valach, Nela Kr má ová, Jan Falta, Jitka ezní ková, Václav Rada</i>	Z,ZK	3	2P+1C+10B	Z	F
21MET2	<b>Meteorology 2</b>	Z,ZK	5	2P+2C	L	F
21MRG1-E	<b>Meteorology 1</b>	KZ	3	2P+2C	L	F
11MSP-E	<b>Modeling of Systems and Processes</b>	Z,ZK	4	2P+2C	L	F
21CON-E	<b>Navigation Calculations</b>	KZ	2	0P+2C	L	F
11FYZ-E	<b>Physics</b> <i>Tomáš Vít , Zuzana Malá, Jana Kuklová Tomáš Vít Tomáš Vít (Gar.)</i>	Z,ZK	5	2P+2C+18B	Z	F
21PAP	<b>Flight Planning and Performance</b>	Z,ZK	4	2P+2C+14B	L	F
21ZKL1-E	<b>Principles of Flight 1</b> <i>Vladimír Machula</i>	ZK	3	2P+1C	L	F
12PPOK	<b>Designing Roads, Highways and Motorways</b> <i>Petr Šatra, Ji í arský, Tomáš Pad lek, Petr Kumpošt</i>	KZ	3	1P+2C+10B	Z	F
21PDLT	<b>Airport Design and Operation</b> <i>Ladislav Capoušek, Petr Líka Ladislav Capoušek</i>	KZ	5	2P+2C	Z	F
21PPLP	<b>Operational Procedures and IFR Flights</b>	Z,ZK	7	4P+2C	L	F
18PZP	<b>Elasticity and Strength</b> <i>Ond ej Jiroušek, Josef Jíra, Petr Koudelka, Daniel Kytý , Jan Vy ichl, Tomáš Doktor, Jan Šleichrt, Radim Dvo ák</i>	Z,ZK	3	2P+1C+10B	Z	F
21RDN-E	<b>Radionavigation</b> <i>Jan Žížka</i>	Z,ZK	3	3P+1C	Z	F
18SAT	<b>Structural Analysis</b>	Z,ZK	4	2P+2C+14B	L	F
11STAT-E	<b>Statistics</b>	Z,ZK	4	2P+2C	L	F

20SYSA	<b>Systems Analysis</b>	Z,ZK	5	2P+2C+14B	L	F
18TED	<b>Technical Documentation</b> <i>Jitka ezní ková, Vít Malinovský</i>	KZ	2	1P+1C+8B	Z	F
17TEDL	<b>Transport Technology and Logistics</b>	KZ	3	2P+1C	L	F
17TGA	<b>Graph Theory and its Applications in Transport</b> <i>Alena Rybí ková, Denisa Mocková, Dušan Teichmann</i>	Z,ZK	4	2P+2C+12B	Z	F
21TVFR-E	<b>Theory for VFR Training</b> <i>Jan Žížka Jan Žížka</i>	Z,ZK	8	4P+4C	Z	F
16UDOP	<b>Introduction into Vehicles</b> <i>Petr Bouchner, Zuzana Radová</i>	Z	2	2P+0C+8B	Z	F
20UITS	<b>Introduction to Intelligent Transport Systems</b> <i>Vladimír Faltus, Pavel Hrubeš, Martin Langr, Patrik Horaž ovský, Ji í R ži ka, Adam Ulanovský</i>	Z,ZK	7	3P+2C+20B	Z	F
21SVFR-E	<b>VFR Communication</b> <i>Milan Kameník Milan Kameník</i>	Z	4	2P+1C	Z	F
21HAV-E	<b>Weight and Balance of Aircraft</b> <i>Denisa Svobodová</i>	Z,ZK	3	2P+2C	L	F
21ZLS	<b>ATM Systems</b> <i>Vladimír Machula Vladimír Machula</i>	Z,ZK	5	2P+2C	Z	F
12ZYDI	<b>Introduction to Transportation Engineering</b> <i>Zuzana arská, Dagmar Ko árková, Vojt ch Novotný</i>	Z,ZK	2	1P+1C	Z	F
21ZALD	<b>Basics of Air Transport</b>	KZ	2	0P+2C+8B	L	F
21ZYL2	<b>Principles of Flight 2</b> <i>P emysl Vávra, Líana Karapetjan P emysl Vávra</i>	Z,ZK	5	2P+2C	Z	F
12ZTS	<b>Railway Lines and Stations</b>	Z,ZK	4	2P+2C+10B	L	F

**Characteristics of the courses of this group of Study Plan: Code=PRO-B-O Name=Courses that will certainly be open**

21LTP1-E	Air Law 1	KZ	3	Air Law; ICAO Doc 7300; ICAO Doc 7500 and 9626; International Organizations: ICAO, IATA, EASA, EUROCONTROL; airworthiness; ICAO Annexes; Commission regulation (EU) 965/2012
21EKL-E	Air Transport Economy	Z,ZK	3	Economic terminology used in air transport. Basic microeconomic laws. Division of the economic disciplines. Economy carrier. Economic indicators in the management of air transport. Business activities in air transport.
21LPTY-E	Aircraft Operations	ZK	2	Aircraft operation for cruise, approach, final approach , missed approach , hodling, PBN, augmented GNSS, aviation charts for IFR flight
21VL-E	Aircraft Performance	Z,ZK	4	Basic terms of aircraft performance, basic characteristic speeds, runway characteristics, single and multiengine aircraft performance class B, aircraft performance class A, take off and landing performance, after take off and missed approach climb, noise abatement procedures, range of aircraft, drift down, MEL, ETOPS.
21LDA1-E	Aircraft 1	Z,ZK	3	Aircraft structural and conceptual design types - definitions and basic knowledge of the problem. Development of requirements, aircraft definitions and categorisation. Aircraft loadings. Systems of primary and secondary airframe structure. Airframe and propulsion unit. Lectures are devoted to aeroplane topics.
21LTA2-E	Aircraft 2	Z,ZK	2	Manufacturers responsibility, responsibilities of operator and professional supervising. Legislation in area of airworthiness. International and national standards. Static solidity of aircraft structures. Aeroelasticity. Inherent and operational reliability of aircraft structure. Fatigue strength. Aircraft structure lifetime presumption.
14ASD	Algorithm and Data Structures	KZ	3	Students will be familiarized with selected basic and derived data structures, algorithms, their properties and their design procedure. Students will analyze problems, propose theoretical solutions to the set task and the resulting algorithm write by means of flowcharts, practice in reading algorithms recorded by means of the flowchart and use the basics of Boolean algebra with forming the conditions for the algorithms.
21APL1-E	Aviation English 1 for Professional Pilot	Z	3	Exercises focused on continuous reading specialized texts, vocabulary extension of technical English, terminology in the sphere of aircraft construction, principles of flight, aircraft engines, instruments and systems, analyzes relating to topics of air traffic, operational procedures, relevant legislation and operators procedures.
21APL2-E	Aviation English 2 for Professional Pilot	Z,ZK	3	Exercises focused on repetition and smoother communication within VFR and IFR communication, communication with technical staff at the airport, a fluent conversation within the airlines.
11CAL1-E	Calculus 1	Z,ZK	7	Sequence of real numbers and its limit. Basic properties of mappings. Function of one real variable, its limit and derivative. Geometric properties of n-dimensional Euklidean space and Cartesian coordinate system. Geometric meaning of the differential of functions several real variables, differential calculus of functions of several real variables.
11CAL2-E	Calculus 2	Z,ZK	5	Indefinite integral, Newtonian integral, Riemannian integral of the function of one variable, improper Riemannian integral, Riemannian integral in Rn. Parametric description of regular k-dimensional surfaces in Rn, Riemannian integral over regular surfaces. Line and surface integrals of the second type, Stokes theorems, ordinary differential equations of the first order, linear differential equations with constant coefficients and its systems
15JZ1A	Foreign Language - English 1	Z	3	Grammatical Structures and Style. Selection of conversation topics relating to transportation sciences. Extending vocabulary, developing perceptive and communicative skills. Elementary stylistics forms. Oral and written presentation of original research. Academic text principles and reading comprehension. Principles of rhetoric.
15JZ2A	Foreign Language - English 2	Z,ZK	3	Grammatical structures and style. Selection of conversation topics relating to transportation sciences. Extending vocabulary, developing perceptive and communicative skills. Elementary stylistics forms. Oral and written presentation of original research. Academic text principles and reading comprehension. Principles of rhetoric.
15JZ3F	Foreign Language - French 3	Z	3	Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.

15JZ4F	Foreign Language - French 4	Z,ZK	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JZ3I	Foreign Language - Italian 3	Z	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JZ4I	Foreign Language - Italian 4	Z,ZK	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JZ3N	Foreign Language - German 3	Z	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JZ4N	Foreign Language - German 4	Z,ZK	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JZ3R	Foreign Language - Russian 3	Z	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JZ4R	Foreign Language - Russian 4	Z,ZK	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JZ3S	Foreign Language - Spanish 3	Z	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JZ4S	Foreign Language - Spanish 4	Z,ZK	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
21DKL	Aviation Data Link Communication	KZ	3
15DPLG	Transportation Psychology	Z	2
Subject of psychology and its basic concepts. Information intake, decision-making and behaviour. Performance. Engineering psychology and vehicle construction. Psychological aspects of travel route and traffic conditions, accidents and traffic incidents. Selection and training of the staff. Work and leisure. Age as a factor in transport operation.			
11EMO-E	Electromagnetic Field and Optics	Z,ZK	4
Electric field. Electric current. Magnetic field. Electromagnetic field. Optics. Basics of solid-state physics.			
21EBLP	European Air Transport Safety Attitude	Z,ZK	4
Reliability and life cycle systems, reliability theory, mathematics tools for reliability, reliability analysis, maintenance systems, theory of operational safety and quality, the basic concept of security, safety management, security management strategy, hazard, risk, risk management.			
21PML-E	Flight Planning and Monitoring	Z,ZK	3
Mass and balance. Load of aircraft. Determination of centre of gravity - loadsheet, trimsheet. Aircraft weighing. Overloading of aircraft. Basic characteristic speeds. Runway characteristics. Take off and landing performance - drift down. ETOPS. MEL. Flight planning and monitoring. Routing. FL and speeds selection. Charts. ICAO ATC FPL. Aerodrom operation minimums. Fuel plan. Operational flight plan.			
21OBN-E	General Navigation	ZK	5
The Earth: latitude and longitude. Reference systems. Circles on the Earth and distance. Calculations. Time. Magnetism and directions. Wind and Speed: Course, heading, track. Calculations: navigation computer - conversions, TAS, rates. Calculations: 1 in 60 and navigation computer - track and GS. Projections. Charts. VFR navigation. Nav Log preparation and use. Navigation display. Navigation in remote and oceanic areas.			
11GIE-E	Geometry	KZ	3
Differential geometry of curves - parameterization, the arc of the curve, torsion and curvature, Frenet's trihedron. Kinematics - a curve as a trajectory of the motion, the velocity, and acceleration of a particle moving on a curved path.			
21LCLT-E	Human Factors in Aviation	ZK	3
Human factors in aviation. Breathing, atmosphere. Heart and circulation. Radiation. Human sensory organs, nervous system. Vision, hearing, illusions. Health and hygiene, fatigue, wakefulness and sleep. Information processing, human error. Cockpit management. Behaviour and workload. Automation. Core competencies.			
21PRJ1-E	Instrumentation 1	ZK	2
Basic classification and construction of flight instruments, electric systems, power plant sensors and instruments, airframe sensors and instruments, measurement of air data parameters, integrated instrument systems.			
21PRJ2-E	Instrumentation 2	ZK	3
Compass, gyroscopic instruments (turn indicator, attitude indicator, directional gyro), inertial instruments, recording and monitoring systems, warning systems (TCAS, GPWS), AFCS (autopilot, flight director, autothrust), FMS, flight envelope protection, communication systems, flight computers			
14KSP	Constructing with Computer Aid	KZ	2
"CAD systems" term determination. CAD role in projecting system model. Existing CAD systems on Czech market. Project creation, basic common work rules in graphic applications and CA systems. Co-ordinated systems, CAD environment skill (basics of constructing, dimensioning, modifications, user interfaces, projecting possibilities, AutoCAD environment profiles, drawings with raster foundations).			
21LGPS	Legislation and Operational Regulations	Z,ZK	8
Introduction into aviation regulations. The scope of international and national organizations in civil aviation. Analysis and interpretation of the ICAO Annexes 1-19, ICAO Docs. 4444, 7030, 8168, analyses and interpretation of the European Parliament and Council Regulations (EC), European Commission Regulations (EU) and the Decisions of the Executive Director of EASA.			

21LAG1	English for Aviation 1 Familiarity with the terminology used in civil aviation in the general context and emphasizing the ability to receive information only in English.	KZ	3
21LAG2	English for Aviation 1	KZ	3
21LCM	Aircraft Engines Aircraft piston engine, theoretical background, operational characteristics and construction schemes. Propellers, operational characteristics. Turbine engine, theoretical background, thermal cycles, construction schemes, operational characteristics. Turbojet and turbofan engines, basic construction modules, and their operational characteristics. Engine control.	Z,ZK	3
21LTTE	Aerodromes Aerodrome reference point and temperature, TORA, TODA, ASDA, LDA. Taxiway and apron. Clearway. Stopway. Obstacle limitation surfaces. Runway marking. Runway zone lights. Environmental conditions. Public traffic.	Z,ZK	4
11LA-E	Linear Algebra Vector spaces (linear combinations, linear independence, dimension, basis, coordinates). Matrices and operations. Systems of linear equations and their solvability. Determinants and their applications. Scalar product. Similarity of matrices (eigenvalues and eigenvectors). Quadratic forms and their classification.	Z,ZK	3
18MTY	Materials Science and Engineering Basic course of materials science and engineering explains mechanical properties of structural materials based on their bonding forces and microstructure. However the main attention is paid to metals as the most important engineering materials, also other major classes of materials are presented, namely ceramics, polymers and composites. Attention is also paid to degradation processes in materials, to defectoscopy and to main mechanical tests.	Z,ZK	3
21MET2	Meteorology 2 Climatic zones, tropical climatology, meteorological situation of mid-latitudes. Icing, turbulence, wind shear, thunderstorms, tornadoes, flying in the stratosphere, mountain areas, reducing visibility phenomena. Observation, weather maps, important information for flight planning.	Z,ZK	5
21MRG1-E	Meteorology 1 Composition, size and vertical structure of the atmosphere. QNH, QFE, QFF, QNE, density and height measurements. Wind, moisture and adiabatic processes. Creating and types of cloud, fog, haze. Precipitation. Types of air masses, atmospheric fronts. Distribution of pressure, cyclones, anticyclones, non-frontal cyclone.	KZ	3
11MSP-E	Modeling of Systems and Processes Mathematical methods and algorithms as a basis for system analysis. Methods for modelling and evaluating the systems in continuous and discrete time domain. Laplace transform, z-transform, and the recursive algorithms in solution of differential and difference equations, as an instrument for system description. Practical use of technical computing environment (MATLAB).	Z,ZK	4
21CON-E	Navigation Calculations Projection of maps; times - UTC, Zulu, LT; positioning; sunrise and sunset; distance calculation; projection; maps and symbols; declination; speed; wind components and wind drift; VFR route selection; position plotting.	KZ	2
11FYZ-E	Physics Kinematics, particle dynamics, dynamics of particle systems and rigid body. Continuum mechanics, thermodynamics.	Z,ZK	5
21PAP	Flight Planning and Performance Mass and balance. Load of aircraft. Determination of centre of gravity - loadsheet, trimsheet. Aircraft weighing. Overloading of aircraft. Basic characteristic speeds. Runway characteristics. Take off and landing performance. Drift down. ETOPS. MEL. Flight planning and monitoring. Routing. FL and speeds selection. Charts. ICAO ATC FPL. Aerodrom operation minimums. Fuel plan. Operational flight plan.	Z,ZK	4
21ZKL1-E	Principles of Flight 1 Aerodynamic drag, relation between drag and speed, streamline, boundary layer, formula of continuity, formula of Bernoulli, lift and drag, air flow and pressures around wing, angle of attack, reactions of wing in air flow, lift and drag of a wing and an aircraft, coefficient of lift and drag, critical angle of attack, wing with final span, induced drag, interference, devices for lift and drag increase.	ZK	3
12PPOK	Designing Roads, Highways and Motorways Definition, types, ownership, maintenance, management and categorization of roads and highways. Curve and transition curve. Sinuosity and standard speed. Route in rural areas. Range of vision for stopping and overtaking. Road body - shapes and proportions, bottom and superstructure. Drainage and components of roads. Safety device. Crossings, junctions, intersections.	KZ	3
21PDLT	Airport Design and Operation Methods for the new airports design. Existing airports development. A closer look at the development of the airports operational areas. Certification of the operating areas and procedures by ICAO Airports Manual. Development planning and project preparation, regulatory basis.	KZ	5
21PPLP	Operational Procedures and IFR Flights Documentation Jeppesen. IFR approach segments. Precision approach ILS/PAR, MLS. Low Visibility Operation (LVO). Non precision approach - ILS without GP, VOR/DME, NDB and SRA. Airport's operational minima. Circuit approach. Holding patterns, SID and STAR. GNSS approach. Altimeter setting procedures. IFR flight procedures. RNAV approach procedures and other operation. CDFFA procedures and principles of increasing airspace capacity.	Z,ZK	7
18PZP	Elasticity and Strength Tension and compression. Bending of beam. Shear stress during bending of beam. Design and analysis of cross section of beam. Design of riveted, bolted and welded joint of structure. Analysis of deflection curve of beam. Torsion of circle cross section. Combined loading. Stability of compressed bar and buckling. Beam on elastic foundation. Strength analysis.	Z,ZK	3
21RDN-E	Radionavigation Ground direction finder (VDF), ADF, VOR and Doppler VOR, DME, ILS, MLS, ground ATC radar, weather Radar, SSR and transponder. Radar utilization for navigation during the flight. Area navigation (RNAV) - general philosophy, gauges and equipment, indication and sensors for RNAV, VOR/DME (RNAV). Autopilot and flight director. Satellite navigation, systems and backups.	Z,ZK	3
18SAT	Structural Analysis General system of forces in plane and space. Calculation of reactions of bodies and structures. Assessment of internal forces on statically determinate beams and simple girders. Principle of virtual work. Kinematic method for calculation of reactions of statically determinate systems. Determination of axial forces in truss constructions. Cross-sectional characteristics of planar shapes. Fiber polygons and chains.	Z,ZK	4
11STAT-E	Statistics Definition of probability, random variable and its description, known distributions, random vector, function of random variable. Methods of point estimation. Testing of statistical hypothesis. Regression and correlation, linear regression, correlation coefficient, coefficient of determination, the general linear model, statistical inference in linear regression, analysis of variance, multiple regression, the use of matrices in regression.	Z,ZK	4
20SYSA	Systems Analysis Introduction to system sciences, system viewpoint, terminology, typical system analysis tasks, system identification, system interface and interface tasks, processes, system behaviour and its analysis, strong functions and processes, genetic code, system identity, system architecture. Tools for system analysis - Petri nets, decision tables, algorithms for structural tasks. Soft and hard systems, methods for soft system analysis.	Z,ZK	5
18TED	Technical Documentation Technical standards, international standardization, technical drawings, representation of technical objects, technical diagrams and charts, dimensional and geometrical accuracy, arrangement of drawing sheets.	KZ	2

17TEDL	Transport Technology and Logistics	KZ	3
Basic terms in transport technology and logistics, particular steps of transport planning, line planning, timetabling, planning in passenger and freight transport, organisation of traffic in each transport modus, technologic factors of the side of operator and client, organisation of city transport, logistic technologies and their application using various transport modus.			
17TGA	Graph Theory and its Applications in Transport	Z,ZK	4
Basic terms of graph theory, paths in graphs, flows in networks, location problems, design problems on graphs, optimum routing, use of graphs in other scientific disciplines.			
21TVFR-E	Theory for VFR Training	Z,ZK	8
Course content is based on PPL(A) theory requirements according to Part-FCL. Lectures cover topics that are necessary to commence the practical part of ATP(A) training, such as principles of flight, airframe and powerplant, aircraft systems, instrumentation, mass and balance, performance, air law and ATC procedures, meteorology, operational procedures, navigation, radionavigation, VFR communication, flight planning and monitoring and human factor.			
16UDOP	Introduction into Vehicles	Z	2
Vehicles and transportation systems. Functionality and setup. Movement and drive principles. Engines and their characteristics. Rail, road, air and water transport. Alternative means of transport. Lifting equipment and conveyors. Legislation.			
20UITS	Introduction to Intelligent Transport Systems	Z,ZK	7
Terminology and legislative framework telematics systems and their architecture. Telematics systems in practice and their operation. Fundamentals of information and telecommunication systems for ITS. Principles and technical support measurement of traffic data, localization and navigation. Practical work with traffic data. Real examples of possible applications of the principles of ITS.			
21SVFR-E	VFR Communication	Z	4
Course contents are based on PART FCL, part 090. It defines terms and abbreviations used in VFR communication. Phraseology and procedures in standard and non-standard situations.			
21HAV-E	Weight and Balance of Aircraft	Z,ZK	3
Basic terms of mass and balance, basic aircraft masses, weighing and maximum aircraft masses, overloading of aircraft, standard weights of passenger, baggage and crew, determination of load of aircraft, flight documentation - loadsheet, trimsheet, securing of load, determination of centre of gravity, influence of centre of gravity position on aircraft performance.			
21ZLS	ATM Systems	Z,ZK	5
The course introduces classical and modern facilities, systems and technologies designated for ATS. Student obtains knowledge of technical principles and solutions as far as communication, navigation and surveillance aviation systems are concerned.			
12ZYDI	Introduction to Transportation Engineering	Z,ZK	2
Role of transportation in land-use planning. Basic terms in transportation engineering. Traffic survey and traffic prognosis. Introduction to topic of roads, public mass transport. Negative impacts of transportation to environment and safety.			
21ZALD	Basics of Air Transport	KZ	2
History, definitions, terminology, basic rules. VFR/IFR. Basics of aerodynamics. Propulsion of aircraft. Aircraft design. Basics of navigation, radio navigation. Weight, balance, performance. Flight planning, optimization of speed and heights, minimum fuel. Limitations of operation, maintenance, service life of aircraft. Traffic management, ground handling, security. Air crew. Airlines and economics. Space technologies.			
21ZYL2	Principles of Flight 2	Z,ZK	5
Static & dynamic longitudinal stability, neutral point, location of centre of gravity, static directional & lateral stability, dynamic directional & lateral stability, control – pitch (longitudinal), yaw (directional) & roll (lateral), roll/yaw interaction, trimming, speed of sound, Mach number, compressibility, shock waves, critical Mach number, aerodynamic heating, operating limitations, manoeuvring envelope, gust-load diagram.			
12ZTS	Railway Lines and Stations	Z,ZK	4
Rail transport. Railway track geometry parameters. Route layout of railway lines. Railway line construction - railway substructure and superstructure. Spatial layout of railway lines. Railway control systems in relation to infrastructure. Operating and carriage points. Railway lines net and category. Traction in rail transport.			

### List of courses of this pass:

Code	Name of the course	Completion	Credits
11CAL1-E	Calculus 1	Z,ZK	7
Sequence of real numbers and its limit. Basic properties of mappings. Function of one real variable, its limit and derivative. Geometric properties of n-dimensional Eukclidean space and Cartesian coordinate system. Geometric meaning of the differential of functions several real variables, differential calculus of functions of several real variables.			
11CAL2-E	Calculus 2	Z,ZK	5
Indefinite integral, Newtonian integral, Riemannian integral of the function of one variable, improper Riemannian integral, Riemannian integral in $R_n$ . Parametric description of regular k-dimensional surfaces in $R_n$ , Riemannian integral over regular surfaces. Line and surface integrals of the second type, Stokes theorems, ordinary differential equations of the first order, linear differential equations with constant coefficients and its systems			
11EMO-E	Electromagnetic Field and Optics	Z,ZK	4
Electric field. Electric current. Magnetic field. Electromagnetic field. Optics. Basics of solid-state physics.			
11FYZ-E	Physics	Z,ZK	5
Kinematics, particle dynamics, dynamics of particle systems and rigid body. Continuum mechanics, thermodynamics.			
11GIE-E	Geometry	KZ	3
Differential geometry of curves - parameterization, the arc of the curve, torsion and curvature, Frenet's trihedron. Kinematics - a curve as a trajectory of the motion, the velocity, and acceleration of a particle moving on a curved path.			
11LA-E	Linear Algebra	Z,ZK	3
Vector spaces (linear combinations, linear independence, dimension, basis, coordinates). Matrices and operations. Systems of linear equations and their solvability. Determinants and their applications. Scalar product. Similarity of matrices (eigenvalues and eigenvectors). Quadratic forms and their classification.			
11MSP-E	Modeling of Systems and Processes	Z,ZK	4
Mathematical methods and algorithms as a basis for system analysis. Methods for modelling and evaluating the systems in continuous and discrete time domain. Laplace transform, z-transform, and the recursive algorithms in solution of differential and difference equations, as an instrument for system description. Practical use of technical computing environment (MATLAB).			

11STAT-E	Statistics	Z,ZK	4
Definition of probability, random variable and its description, known distributions, random vector, function of random variable. Methods of point estimation. Testing of statistical hypothesis. Regression and correlation, linear regression, correlation coefficient, coefficient of determination, the general linear model, statistical inference in linear regression, analysis of variance, multiple regression, the use of matrices in regression.			
12PPOK	Designing Roads, Highways and Motorways	KZ	3
Definition, types, ownership, maintenance, management and categorization of roads and highways. Curve and transition curve. Sinuosity and standard speed. Route in rural areas. Range of vision for stopping and overtaking. Road body - shapes and proportions, bottom and superstructure. Drainage and components of roads. Safety device. Crossings, junctions, intersections.			
12ZTS	Railway Lines and Stations	Z,ZK	4
Rail transport. Railway track geometry parameters. Route layout of railway lines. Railway line construction - railway substructure and superstructure. Spatial layout of railway lines. Railway control systems in relation to infrastructure. Operating and carriage points. Railway lines net and category. Traction in rail transport.			
12ZYDI	Introduction to Transportation Engineering	Z,ZK	2
Role of transportation in land-use planning. Basic terms in transportation engineering. Traffic survey and traffic prognosis. Introduction to topic of roads, public mass transport. Negative impacts of transportation to environment and safety.			
14ASD	Algorithm and Data Structures	KZ	3
Students will be familiarized with selected basic and derived data structures, algorithms, their properties and their design procedure. Students will analyze problems, propose theoretical solutions to the set task and the resulting algorithm write by means of flowcharts, practice in reading algorithms recorded by means of the flowchart and use the basics of Boolean algebra with forming the conditions for the algorithms.			
14KSP	Constructing with Computer Aid	KZ	2
"CAD systems" term determination. CAD role in projecting system model. Existing CAD systems on Czech market. Project creation, basic common work rules in graphic applications and CA systems. Co-ordinated systems, CAD environment skill (basics of constructing, dimensioning, modifications, user interfaces, projecting possibilities, AutoCAD environment profiles, drawings with raster foundations).			
15DPLG	Transportation Psychology	Z	2
Subject of psychology and its basic concepts. Information intake, decision-making and behaviour. Performance. Engineering psychology and vehicle construction. Psychological aspects of travel route and traffic conditions, accidents and traffic incidents. Selection and training of the staff. Work and leisure. Age as a factor in transport operation.			
15JZ1A	Foreign Language - English 1	Z	3
Grammatical Structures and Style. Selection of conversation topics relating to transportation sciences. Extending vocabulary, developing perceptive and communicative skills. Elementary stylistics forms. Oral and written presentation of original research. Academic text principles and reading comprehension. Principles of rhetoric.			
15JZ2A	Foreign Language - English 2	Z,ZK	3
Grammatical structures and style. Selection of conversation topics relating to transportation sciences. Extending vocabulary, developing perceptive and communicative skills. Elementary stylistics forms. Oral and written presentation of original research. Academic text principles and reading comprehension. Principles of rhetoric.			
15JZ3F	Foreign Language - French 3	Z	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JZ3I	Foreign Language - Italian 3	Z	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JZ3N	Foreign Language - German 3	Z	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JZ3R	Foreign Language - Russian 3	Z	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JZ3S	Foreign Language - Spanish 3	Z	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JZ4F	Foreign Language - French 4	Z,ZK	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JZ4I	Foreign Language - Italian 4	Z,ZK	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JZ4N	Foreign Language - German 4	Z,ZK	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JZ4R	Foreign Language - Russian 4	Z,ZK	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JZ4S	Foreign Language - Spanish 4	Z,ZK	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			

16UDOP	Introduction into Vehicles	Z	2
Vehicles and transportation systems. Functionality and setup. Movement and drive principles. Engines and their characteristics. Rail, road, air and water transport. Alternative means of transport. Lifting equipment and conveyors. Legislation.			
17TEDL	Transport Technology and Logistics	KZ	3
Basic terms in transport technology and logistics, particular steps of transport planning, line planning, timetabling, planning in passenger and freight transport, organisation of traffic in each transport modus, technologic factors of the side of operator and client, organisation of city transport, logistic technologies and their application using various transport modus.			
17TGA	Graph Theory and its Applications in Transport	Z,ZK	4
Basic terms of graph theory, paths in graphs, flows in networks, location problems, design problems on graphs, optimum routing, use of graphs in other scientific disciplines.			
18MTY	Materials Science and Engineering	Z,ZK	3
Basic course of materials science and engineering explains mechanical properties of structural materials based on their bonding forces and microstructure. However the main attention is paid to metals as the most important engineering materials, also other major classes of materials are presented, namely ceramics, polymers and composites. Attention is also paid to degradation processes in materials, to defectoscopy and to main mechanical tests.			
18PZP	Elasticity and Strength	Z,ZK	3
Tension and compression. Bending of beam. Shear stress during bending of beam. Design and analysis of cross section of beam. Design of riveted, bolted and welded joint of structure. Analysis of deflection curve of beam. Torsion of circle cross section. Combined loading. Stability of compressed bar and buckling. Beam on elastic foundation. Strength analysis.			
18SAT	Structural Analysis	Z,ZK	4
General system of forces in plane and space. Calculation of reactions of bodies and structures. Assessment of internal forces on statically determinate beams and simple girders. Principle of virtual work. Kinematic method for calculation of reactions of statically determinate systems. Determination of axial forces in truss constructions. Cross-sectional characteristics of planar shapes. Fiber polygons and chains.			
18TED	Technical Documentation	KZ	2
Technical standards, international standardization, technical drawings, representation of technical objects, technical diagrams and charts, dimensional and geometrical accuracy, arrangement of drawing sheets.			
20SYSA	Systems Analysis	Z,ZK	5
Introduction to system sciences, system viewpoint, terminology, typical system analysis tasks, system identification, system interface and interface tasks, processes, system behaviour and its analysis, strong functions and processes, genetic code, system identity, system architecture. Tools for system analysis - Petri nets, decision tables, algorithms for structural tasks. Soft and hard systems, methods for soft system analysis.			
20UITS	Introduction to Intelligent Transport Systems	Z,ZK	7
Terminology and legislative framework telematics systems and their architecture. Telematics systems in practice and their operation. Fundamentals of information and telecommunication systems for ITS. Principles and technical support measurement of traffic data, localization and navigation. Practical work with traffic data. Real examples of possible applications of the principles of ITS.			
21APL1-E	Aviation English 1 for Professional Pilot	Z	3
Exercises focused on continuous reading specialized texts, vocabulary extension of technical English, terminology in the sphere of aircraft construction, principles of flight, aircraft engines, instruments and systems, analyzes relating to topics of air traffic, operational procedures, relevant legislation and operators procedures.			
21APL2-E	Aviation English 2 for Professional Pilot	Z,ZK	3
Exercises focused on repetition and smoother communication within VFR and IFR communication, communication with technical staff at the airport, a fluent conversation within the airlines.			
21CON-E	Navigation Calculations	KZ	2
Projection of maps; times - UTC, Zulu, LT; positioning; sunrise and sunset; distance calculation; projection; maps and symbols; declination; speed; wind components and wind drift; VFR route selection; position plotting.			
21DKL	Aviation Data Link Communication	KZ	3
21EBLP	European Air Transport Safety Attitude	Z,ZK	4
Reliability and life cycle systems, reliability theory, mathematics tools for reliability, reliability analysis, maintenance systems, theory of operational safety and quality, the basic concept of security, safety management, security management strategy, hazard, risk, risk management.			
21EKL-E	Air Transport Economy	Z,ZK	3
Economic terminology used in air transport. Basic microeconomic laws. Division of the economic disciplines. Economy carrier. Economic indicators in the management of air transport. Business activities in air transport.			
21HAVE-E	Weight and Balance of Aircraft	Z,ZK	3
Basic terms of mass and balance, basic aircraft masses, weighing and maximum aircrafts masses, overloading of aircraft, standard weights of passenger, baggage and crew, determination of load of aircraft, flight documentation - loadsheets, trimsheet, securing of load, determination of centre of gravity, influence of centre of gravity position on aircraft performance.			
21LAG1	English for Aviation 1	KZ	3
Familiarity with the terminology used in civil aviation in the general context and emphasizing the ability to receive information only in English.			
21LAG2	English for Aviation 1	KZ	3
21LCLT-E	Human Factors in Aviation	ZK	3
Human factors in aviation. Breathing, atmosphere. Heart and circulation. Radiation. Human sensory organs, nervous system. Vision, hearing, illusions. Health and hygiene, fatigue, wakefulness and sleep. Information processing, human error. Cockpit management. Behaviour and workload. Automation. Core competencies.			
21LCM	Aircraft Engines	Z,ZK	3
Aircraft piston engine, theoretical background, operational characteristics and construction schemes. Propellers, operational characteristics. Turbine engine, theoretical background, thermal cycles, construction schemes, operational characteristics. Turbojet and turboprop engines, basic construction modules, and their operational characteristics. Engine control.			
21LDA1-E	Aircraft 1	Z,ZK	3
Aircraft structural and conceptual design types - definitions and basic knowledge of the problem. Development of requirements, aircraft definitions and categorisation. Aircraft loadings. Systems of primary and secondary airframe structure. Airframe and propulsion unit. Lectures are devoted to aeroplane topics.			
21LGPS	Legislation and Operational Regulations	Z,ZK	8
Introduction into aviation regulations. The scope of international and national organizations in civil aviation. Analysis and interpretation of the ICAO Annexes 1-19, ICAO Docs. 4444, 7030, 8168, analyses and interpretation of the European Parliament and Council Regulations (EC), European Commission Regulations (EU) and the Decisions of the Executive Director of EASA.			
21LPTY-E	Aircraft Operations	ZK	2
Aircraft operation for cruise, approach, final approach, missed approach, holding, PBN, augmented GNSS, aviation charts for IFR flight			
21LTA2-E	Aircraft 2	Z,ZK	2
Manufacturers responsibility, responsibilities of operator and professional supervising. Legislation in area of airworthiness. International and national standards. Static solidity of aircraft structures. Aeroelasticity. Inherent and operational reliability of aircraft structure. Fatigue strength. Aircraft structure lifetime presumption.			



21LTP1-E	Air Law 1 Air Law; ICAO Doc 7300; ICAO Doc 7500 and 9626; International Organizations: ICAO, IATA, EASA, EUROCONTROL; airworthiness; ICAO Annexes; Commission regulation (EU) 965/2012	KZ	3
21LTTE	Aerodromes Aerodrome reference point and temperature, TORA, TODA, ASDA, LDA. Taxiway and apron. Clearway. Stopway. Obstacle limitation surfaces. Runway marking. Runway zone lights. Environmental conditions. Public traffic.	Z,ZK	4
21MET2	Meteorology 2 Climatic zones, tropical climatology, meteorological situation of mid-latitudes. Icing, turbulence, wind shear, thunderstorms, tornadoes, flying in the stratosphere, mountain areas, reducing visibility phenomena. Observation, weather maps, important information for flight planning.	Z,ZK	5
21MRG1-E	Meteorology 1 Composition, size and vertical structure of the atmosphere. QNH, QFE, QFF, QNE, density and height measurements. Wind, moisture and adiabatic processes. Creating and types of cloud, fog, haze. Precipitation. Types of air masses, atmospheric fronts. Distribution of pressure, cyclones, anticyclones, non-frontal cyclone.	KZ	3
21OBN-E	General Navigation The Earth: latitude and longitude. Reference systems. Circles on the Earth and distance. Calculations. Time. Magnetism and directions. Wind and Speed: Course, heading, track. Calculations: navigation computer – conversions, TAS, rates. Calculations: 1 in 60 and navigation computer – track and GS. Projections. Charts. VFR navigation. Nav Log preparation and use. Navigation display. Navigation in remote and oceanic areas.	ZK	5
21PAP	Flight Planning and Performance Mass and balance. Load of aircraft. Determination of centre of gravity - loadsheet, trimsheet. Aircraft weighing. Overloading of aircraft. Basic characteristic speeds. Runway characteristics. Take off and landing performance. Drift down. ETOPS. MEL. Flight planning and monitoring. Routing. FL and speeds selection. Charts. ICAO ATC FPL. Aerodrom operation minimums. Fuel plan. Operational flight plan.	Z,ZK	4
21PDLT	Airport Design and Operation Methods for the new airports design. Existing airports development. A closer look at the development of the airports operational areas. Certification of the operating areas and procedures by ICAO Airports Manual. Development planning and project preparation, regulatory basis.	KZ	5
21PML-E	Flight Planning and Monitoring Mass and balance. Load of aircraft. Determination of centre of gravity - loadsheet, trimsheet. Aircraft weighing. Overloading of aircraft. Basic characteristic speeds. Runway characteristics. Take off and landing performance. Drift down. ETOPS. MEL. Flight planning and monitoring. Routing. FL and speeds selection. Charts. ICAO ATC FPL. Aerodrom operation minimums. Fuel plan. Operational flight plan.	Z,ZK	3
21PPLP	Operational Procedures and IFR Flights Documentation Jeppesen. IFR approach segments. Precision approach ILS/PAR, MLS. Low Visibility Operation (LVO). Non precision approach - ILS without GP, VOR/DME, NDB and SRA. Airport's operational minima. Circuit approach. Holding patterns, SID and STAR. GNSS approach. Altimeter setting procedures. IFR flight procedures. RNAV approach procedures and other operation. CDFA procedures and principles of increasing airspace capacity.	Z,ZK	7
21PRJ1-E	Instrumentation 1 Basic classification and construction of flight instruments, electric systems, power plant sensors and instruments, airframe sensors and instruments, measurement of air data parameters, integrated instrument systems.	ZK	2
21PRJ2-E	Instrumentation 2 Compass, gyroscopic instruments (turn indicator, attitude indicator, directional gyro), inertial instruments, recording and monitoring systems, warning systems (TCAS, GPWS), AFCS (autopilot, flight director, autothrust), FMS, flight envelope protection, communication systems, flight computers	ZK	3
21RDN-E	Radionavigation Ground direction finder (VDF), ADF, VOR and Doppler VOR, DME, ILS, MLS, ground ATC radar, weather Radar, SSR and transponder. Radar utilization for navigation during the flight. Area navigation (RNAV) - general philosophy, gauges and equipment, indication and sensors for RNAV, VOR/DME (RNAV). Autopilot and flight director. Satellite navigation, systems and backups.	Z,ZK	3
21SVFR-E	VFR Communication Course contents are based on PART FCL, part 090. It defines terms and abbreviations used in VFR communication. Phraseology and procedures in standard and non-standard situations.	Z	4
21TVFR-E	Theory for VFR Training Course content is based on PPL(A) theory requirements according to Part-FCL. Lectures cover topics that are necessary to commence the practical part of ATP(A) training, such as principles of flight, airframe and powerplant, aircraft systems, instrumentation, mass and balance, performance, air law and ATC procedures, meteorology, operational procedures, navigation, radionavigation, VFR communication, flight planning and monitoring and human factor.	Z,ZK	8
21VL-E	Aircraft Performance Basic terms of aircraft performance, basic characteristic speeds, runway characteristics, single and multiengine aircraft performance class B, aircraft performance class A, take off and landing performance, after take off and missed approach climb, noise abatement procedures, range of aircraft, drift down, MEL, ETOPS.	Z,ZK	4
21ZALD	Basics of Air Transport History, definitions, terminology, basic rules. VFR/IFR. Basics of aerodynamics. Propulsion of aircraft. Aircraft design. Basics of navigation, radio navigation. Weight, balance, performance. Flight planning, optimization of speed and heights, minimum fuel. Limitations of operation, maintenance, service life of aircraft. Traffic management, ground handling, security. Air crew. Airlines and economics. Space technologies.	KZ	2
21ZKL1-E	Principles of Flight 1 Aerodynamic drag, relation between drag and speed, streamline, boundary layer, formula of continuity, formula of Bernoulli, lift and drag, air flow and pressures around wing, angle of attack, reactions of wing in air flow, lift and drag of a wing and an aircraft, coefficient of lift and drag, critical angle of attack, wing with final span, induced drag, interference, devices for lift and drag increase.	ZK	3
21ZLS	ATM Systems The course introduces classical and modern facilities, systems and technologies designated for ATS. Student obtains knowledge of technical principles and solutions as far as communication, navigation and surveillance aviation systems are concerned.	Z,ZK	5
21ZYL2	Principles of Flight 2 Static & dynamic longitudinal stability, neutral point, location of centre of gravity, static directional & lateral stability, dynamic directional & lateral stability, control – pitch (longitudinal), yaw (directional) & roll (lateral), roll/yaw interaction, trimming, speed of sound, Mach number, compressibility, shock waves, critical Mach number, aerodynamic heating, operating limitations, manoeuvring envelope, gust-load diagram.	Z,ZK	5

For updated information see <http://bilakniha.cvut.cz/en/FF.html>

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