

# Study plan

## Name of study plan: KOMBI bak. studium od 16-17 (obor LED)

Faculty/Institute/Others:

Department:

Branch of study guaranteed by the department: Air Transport

Garantor of the study branch: prof. Ing. V ra Vořtová, CSc.

Program of study: Technology in Transportation and Telecommunications

Type of study: Bachelor combined

Required credits: 180

Elective courses credits: 0

Sum of credits in the plan: 180

Note on the plan:

Name of the block: Compulsory courses

Minimal number of credits of the block: 162

The role of the block: Z

Code of the group: 1S K LOG LED 16-17 P

Name of the group: 1. sem. bak. KOMBI obory LOG, LED 16-17 povinné p edm ty

Requirement credits in the group: In this group you have to gain 30 credits

Requirement courses in the group: In this group you have to complete 9 courses

Credits in the group: 30

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
611CAL1	<b>Calculus 1</b> Romana Zibnerová	Z,ZK	7	2P+4C+2B	Z	z
611LA	<b>Linear Algebra</b> Romana Zibnerová	Z,ZK	3	2P+1C+10B	Z	z
612ZYDK	<b>Introduction to Transportation Engineering</b> Dagmar Ko árková	Z,ZK	3	6B	Z	z
618MTY	<b>Materials Science and Engineering</b> Vít Malinovský	Z,ZK	3	2P+1C+10B	Z	z
620SYSA	<b>Systems Analysis</b> Martin Langr, Ji í R ži ka, Petr Bureš, Patrik Horaž ovský	Z,ZK	5	2P+2C+14B	L	z
611GIE	<b>Geometry</b> Vít Malinovský	KZ	3	2P+2C+12B	Z	z
614AS	<b>Algorithm and Data Structures</b>	KZ	2	0+2	Z	z
618TED	<b>Technical Documentation</b> Vít Malinovský	KZ	2	1P+1C+8B	Z	z
616UDOP	<b>Introduction into Vehicles</b> Josef Mík, Zuzana Radová	Z	2	2P+0C+8B	Z	z

### Characteristics of the courses of this group of Study Plan: Code=1S K LOG LED 16-17 P Name=1. sem. bak. KOMBI obory LOG, LED 16-17 povinné p edm ty

611CAL1	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.
611LA	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.
612ZYDK	Introduction to Transportation Engineering	Z,ZK	3	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.
618MTY	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.

620SYSA	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.			
611GIE	Geometry	KZ	3
Orthographic and oblique projections, linear perspective. Topographic surfaces and their orthogonal projection. Differential geometry of curves - parameterization, 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.			
614AS	Algorithm and Data Structures	KZ	2
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.			
618TED	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.			
616UDOP	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.			

Code of the group: 2S K LOG LED 16-17 P

Name of the group: 2. sem. bak. KOMBI obory LOG, LED 16-17 povinné p edm ty

Requirement credits in the group: In this group you have to gain 30 credits

Requirement courses in the group: In this group you have to complete 8 courses

Credits in the group: 30

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
611CAL2	<b>Calculus 2</b> Romana Zibnerová	Z,ZK	5	2P+3C+20B	L	Z
611FY1	<b>Physics 1</b>	Z,ZK	4	2+2	L	Z
611STAS	<b>Statistics</b>	Z,ZK	5	2+2	L	Z
612ZTS	<b>Railway Lines and Stations</b> Ondřej Trešl, Tomáš Javořík	Z,ZK	4	2P+2C+10B	L	Z
618SAT	<b>Structural Analysis</b> Petr Koudelka, Jan Šleichrt, Michaela Neuhäuserová	Z,ZK	4	2P+2C+14B	L	Z
614PRG	<b>Programming</b> Libor Židek	KZ	2	0P+2C+8B	L	Z
617TEDK	<b>Transport Technology and Logistics</b> Michal Drábek	KZ	4	12B	L	Z
621ZALD	<b>Basics of Air Transport</b> Jakub Hospodka	KZ	2	0P+2C+8B	L	Z

Characteristics of the courses of this group of Study Plan: Code=2S K LOG LED 16-17 P Name=2. sem. bak. KOMBI obory LOG, LED 16-17 povinné p edm ty

611CAL2	Calculus 2	Z,ZK	5
Antiderivative, 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.			
611FY1	Physics 1	Z,ZK	4
Kinematics, particle dynamics, dynamics of particle systems and rigid body. Continuum mechanics, thermodynamics, electric field, directed electric current.			
611STAS	Statistics	Z,ZK	5
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.			
612ZTS	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.			
618SAT	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.			
614PRG	Programming	KZ	2
Algorithm development, methods of structured programming, high-level programming languages, basics of C programming languages (types, variables, conditions, cycles, arrays, functions), programming techniques, complexity.			
617TEDK	Transport Technology and Logistics	KZ	4
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.			

621ZALD	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.			

Code of the group: 3S K LOG LED 17-18 P

Name of the group: 3. sem. bak. KOMBI obory LOG,LED 17-18 povinné p edm ty

Requirement credits in the group: In this group you have to gain 30 credits

Requirement courses in the group: In this group you have to complete 9 courses

Credits in the group: 30

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
615DPLG	<b>Transportation Psychology</b> Jana Štikarová, Tomáš Burian	Z	2	2P+0C+6B	Z	z
623BDIS	<b>Safety Technologies of Transportation and Information Systems</b>	KZ	3	2+0	Z	z
612MDE	<b>Transport Models and Transport Excesses</b> Josef Kocourek, Tomáš Pad lek	Z,ZK	3	2P+1C+8B	Z	z
617TGA	<b>Graph Theory and its Applications in Transport</b> Josef Volek	Z,ZK	4	2P+2C+12B	Z	z
618PZP	<b>Elasticity and Strength</b> Jan Šleichrt, Tomáš Doktor	Z,ZK	3	2P+1C+10B	Z	z
620UITS	<b>Introduction to Intelligent Transport Systems</b> Vladimír Faltus	Z,ZK	7	3P+2C+20B	Z	z
612PPOK	<b>Designing Roads, Highways and Motorways</b> Tomáš Pad lek, Ji í arský, Petr Kumpošt	KZ	3	1P+2C+10B	Z	z
614DATS	<b>Database Systems</b> Ond ej Smíšek	KZ	2	1P+1C+10B	Z	z
615JZ1A	<b>Foreign Language - English 1</b> V ra Pastorková	Z	3	0P+4C+10B	Z	z

Characteristics of the courses of this group of Study Plan: Code=3S K LOG LED 17-18 P Name=3. sem. bak. KOMBI obory LOG,LED 17-18 povinné p edm ty

615DPLG	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.			
623BDIS	Safety Technologies of Transportation and Information Systems	KZ	3
Safety of transportation means - principles, testing, evaluation. Safety of infrastructures, critical structures, crisis scenarios. Safety of information systems and their robustness.			
612MDE	Transport Models and Transport Excesses	Z,ZK	3
Parameters of the traffic flow and methods for their measurement. Models of the traffic flow, communications load, line and urban systems. Theory of queues, shock waves. Quality of transport and its assessment. Statistical characteristics of transport. Transport excesses, their analysis, the causes, identify and minimize the consequences. Improving of transport safety and fluency.			
617TGA	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.			
618PZP	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.			
620UITS	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.			
612PPOK	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.			
614DATS	Database Systems	KZ	2
Basic concepts of database systems, conceptual model, relational data model, the principles of normal forms, relational database design, security and integrity of data, database queries, relational algebra, SQL language, client / server, multilayer architectures, distributed database systems. Access to data via the WWW.			
615JZ1A	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.			

Code of the group: 4S K LED 17-18 P

Name of the group: 4. sem. bak. KOMBI obor LED 17-18 povinné p edm ty

Requirement credits in the group: In this group you have to gain 26 credits

Requirement courses in the group: In this group you have to complete 8 courses

Credits in the group: 26

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
611MSP	<b>Modeling of Systems and Processes</b> Marek Honc	Z,ZK	4	2P+2C+12B	L	Z
621LTN	<b>Air Navigation</b> Ladislav Keller	Z,ZK	2	2P+1C+12B	L	Z
621LTTE	<b>Aerodromes</b> Jakub Hospodka, Petr Líka	Z,ZK	4	2P+1C+12B	L	Z
621ZYL1	<b>Principles of Flight 1</b> Jakub Hospodka	Z,ZK	5	2P+2C+16B	L	Z
621LL1	<b>Aircraft 1</b> Ladislav Keller	KZ	3	2P+1C+10B	L	Z
621MRG	<b>Meteorology</b> Iveta Kameníková	KZ	3	1P+1C+10B	L	Z
621ULCT	<b>Aircraft Maintenance</b> Jakub Hospodka	Z	2	2P+0C+8B	L	Z
615JZ2A	<b>Foreign Language - English 2</b> V ra Pastorková	Z,ZK	3	0P+4C+10B	L	Z

Characteristics of the courses of this group of Study Plan: Code=4S K LED 17-18 P Name=4. sem. bak. KOMBI obor LED 17-18 povinné p edm ty

611MSP	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).
621LTN	Air Navigation	Z,ZK	2	Earth - its shape, parameters and properties. Aeronautical charts and their use. Measuring time. Dead reckoning. Radionavigation aids. Global navigation satellite systems. Air traffic services routes and their design.
621LTTE	Aerodromes	Z,ZK	4	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.
621ZYL1	Principles of Flight 1	Z,ZK	5	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.
621LL1	Aircraft 1	KZ	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.
621MRG	Meteorology	KZ	3	Structure of atmosphere. Vertical stratification. Pressures QNH, QFE, QFF, QME. Instability. Atmospheric fronts. Atmospheric rainfall, origin fission. Turbulence. Powers causing wind. Cyclone and anticyclone. Gradient wind. Geostrophical and geocyklostrophical wind. Visibilities in air transport. Dangerous meteorological aspects. Meteorological maps. Climatology. Circulation. Intertropical front. Meteorological informations.
621ULCT	Aircraft Maintenance	Z	2	Aircraft operations and technical operations. Maintenance and work processes. Defects search methods, status check diagnostic tools. Selection and qualification of aviation personnel. Basic documentation for maintenance. Optimization of time maintenance intervals. Regulation no. 1321/2014 Part 145. Human factors of aircraft maintenance. Regulation of director EASA for aircraft maintenance. Seminars will be focused on practical application.
615JZ2A	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.

Code of the group: 5S K LED 18-19 P

Name of the group: 5. sem. bak. KOMBI obor LED 18-19 povinné p edm ty

Requirement credits in the group: In this group you have to gain 23 credits

Requirement courses in the group: In this group you have to complete 7 courses

Credits in the group: 23

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
621LCM	<b>Aircraft Engines</b> Daniel Hanus	Z,ZK	3	2P+1C+12B	Z	Z
621LGP	<b>Legislation and Operational Regulations</b> Jakub Hospodka, Radoslav Zozuák	Z,ZK	5	2P+2C+14B	Z	Z
621LTA2	<b>Aircraft 2</b> Ladislav Keller	Z,ZK	2	2P+1C+12B	Z	Z

621ZT	<b>ATM Systems</b> <i>Stanislav Pleninger</i>	ZK	2	2P+0C+8B	Z	z
621ZYL2	<b>Principles of Flight 2</b> <i>Jakub Hospodka, P emysl Vávra</i>	Z,ZK	5	2P+2C+16B	Z	z
621LAG1	<b>English for Aviation 1</b> <i>Slobodan Stoji</i>	KZ	3	0P+2C+10B	Z	z
621PDLE	<b>Airport Design and Operation</b> <i>Petr Líka</i>	KZ	3	1P+1C+8B	Z	z

**Characteristics of the courses of this group of Study Plan: Code=5S K LED 18-19 P Name=5. sem. bak. KOMBI obor LED 18-19 povinné p edm ty**

621LCM	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 turbofan engines, basic construction modules, and their operational characteristics. Engine control.		
621LGP	Legislation and Operational Regulations	Z,ZK	5	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. Introduction to the European Parliament and Council Regulation (EC), Commission Regulation (EU) and the Decisions of the Executive Director of EASA.		
621LTA2	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.		
621ZT	ATM Systems	ZK	2	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.		
621ZYL2	Principles of Flight 2	Z,ZK	5	Ways of producing thrust, propeller, jet propulsion, thrust and momentum, propulsion efficiency, aerodynamics of fixed and variable pitch propeller, propeller operation modes, propeller airstream effect, gyroscopic effect, balance of forces in horizontal flight, glide and landing, performances, take off an climb, acceleration, positive load, manoeuvres, stability and controllability, transsonic speeds.		
621LAG1	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.		
621PDLE	Airport Design and Operation	KZ	3	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.		

Code of the group: 6S K LED 18-19 P

Name of the group: 6. sem. bak. KOMBI obor LED 18-19 povinné p edm ty

Requirement credits in the group: In this group you have to gain 23 credits

Requirement courses in the group: In this group you have to complete 7 courses

Credits in the group: 23

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) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
621ELED	<b>Air Transport Economy</b> <i>Peter Vittek</i>	Z,ZK	4	2P+2C+14B	L	z
621LIVO	<b>Human Performance and Limitations</b> <i>Vladimír Socha</i>	Z,ZK	5	2P+2C+14B	L	z
621OBP	<b>Airline Business and Operations</b> <i>Ladislav Capoušek</i>	Z,ZK	3	2P+1C+12B	L	z
621PAP	<b>Flight Planning and Performance</b> <i>Jakub Hospodka</i>	Z,ZK	4	2P+2C+14B	L	z
621LAG2	<b>English in Aviation 2</b> <i>Slobodan Stoji</i>	KZ	3	0P+2C+10B	L	z
621PJE	<b>Aircraft Instruments</b> <i>Jakub Hospodka</i>	KZ	2	2P+0C+8B	L	z
621RILP	<b>Air Traffic Control</b> <i>Stanislav Pleninger</i>	Z	2	0P+2C+8B	L	z

**Characteristics of the courses of this group of Study Plan: Code=6S K LED 18-19 P Name=6. sem. bak. KOMBI obor LED 18-19 povinné p edm ty**

621ELED	Air Transport Economy	Z,ZK	4	Economic benefits of air transport. Costs of airline. Revenue management. Fuel management. Currencies development. Demand and supply. Rates in air transport. Aircraft selection. Fleet assignment. Aging of aircraft. Airlines bankruptcy. Crew planning. Marketing in Air Transport. Cargo tariff and rates. Air network configuration.		
621LIVO	Human Performance and Limitations	Z,ZK	5	Human performance & limitations, aptibility & competence, accident statistics, flight safety, basics of flight physiology, man & environment, breathing & circulation, sensory system, health & hygiene, health preservation, intoxication, incapacitation, basics of flight psychology, human information processing, memory & learning, theory & model of human error, body rhythms & sleep, stress, fatigue, working methods.		
621OBP	Airline Business and Operations	Z,ZK	3	Airline business and operation abbreviations and terminology. Civil aviation structure in the Czech republic. Act No. 49/1997 Coll., on civil aviation. Air transport regulations ICAO, EU, IATA, ICAO, ECAC, JAA, EUROCONTROL. Air operators. Air transport distribution. Global distribution and reservation systems. Agreements among air operators. Air traffic manuals and publications. Passenger and cargo air transport.		

621PAP	Flight Planning and Performance	Z,ZK	4
Mass and balance. Load of aircraft. Determination of centre of gravity - loadsheets, 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.			
621LAG2	English in Aviation 2	KZ	3
Terminology in the sphere of aircraft construction, principles of flight, aircraft engines, instruments and systems.			
621PJE	Aircraft Instruments	KZ	2
Overview of aircraft instrumentation and its principles and construction, aircraft electrical systems, engine measuring and monitoring systems, air data computer, icing monitoring systems, gyroscopic indicators, inertial and radio navigation means, communication means, data recorders, complex flight and navigation data processing systems.			
621RILP	Air Traffic Control	Z	2
Air traffic services and their distribution. Organization of air traffic, flow and capacity management. Airspace management. System support for aircraft flying through space. Flight plan, the form, content. Separation of aircraft. Reports of air traffic services, the form, content. Harmonization and integration of ATC. CFMU and its subsystems. Flexible use of airspace - FUA. RVSM, RNP. New trends in the area of ATC.			

Name of the block: Compulsory elective courses

Minimal number of credits of the block: 12

The role of the block: PV

Code of the group: PVP KOMBI 17-18

Name of the group: PVP pro bak .KOMBI 17-18 (4.LS+5.ZS+6.LS) pro LOG a LED obory

Requirement credits in the group: In this group you have to gain 12 credits

Requirement courses in the group: In this group you have to complete 3 courses

Credits in the group: 12

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) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
617W1AF	<b>Alternative Forms of Transportation Project Financing</b>	KZ	4	8	Z	PV
621W1BC	<b>Aviation safety and security</b> <i>Slobodan Stoji</i>	KZ	4	8B	L	PV
615W1BO	<b>Work Safety and Health Protection in Transportation</b> <i>Petr Musil</i>	KZ	4	8B	L	PV
617W1EV	<b>Public Sector Economy</b>	KZ	4	8B	Z	PV
621W1FN	<b>Factors Affecting the Rate of Accidents in Aviation</b>	KZ	4	8	Z	PV
614W1HW	<b>Computer Hardware</b>	KZ	4	8B	L	PV
615W1HD	<b>History of City Mass Transport</b>	KZ	4	8	Z	PV
615W1HE	<b>Work Hygiene and Ergonomics in Traffic</b> <i>Petr Musil</i>	KZ	4	8B	Z	PV
621W1LA	<b>Aerobatics</b>	KZ	4	8	L	PV
621W1LR	<b>Radio Technology in Aviation</b>	KZ	4	8	L	PV
617W1LL	<b>Logistics of Passenger and Freight Air Transportation</b>	KZ	4	8B	L	PV
621W1MZ	<b>Managerial Ethics</b>	KZ	4	8	Z	PV
617W1MD	<b>Marketing in Transportation</b> <i>Alexandra Dvořáková</i>	KZ	4	8B	Z	PV
617W1ND	<b>Maritime Transportation</b>	KZ	4	8	Z	PV
621W1OL	<b>Security of Air Transport</b>	KZ	4	8	L	PV
617W1OF	<b>Personal Finance</b> <i>Alexandra Dvořáková</i>	KZ	4	8B	Z	PV
617W1PM	<b>Personnel Management</b> <i>Stanislava Holíková</i>	KZ	4	8B	L	PV
614W1PZ	<b>Advanced Data Processing in Spreadsheets</b> <i>Jan Mejstřík</i>	KZ	4	8B	Z	PV
614W1PJ	<b>C Programming Language</b>	KZ	4	8B	Z	PV
616W1PV	<b>Operation, Construction and Maintenance of Vehicles</b>	KZ	4	8B	L	PV
621W1RZ	<b>Human Resources Management</b>	KZ	4	8B	L	PV
617W1ST	<b>Titan Simulation</b> <i>Alexandra Dvořáková</i>	KZ	4	8B	L	PV
617W1SL	<b>Sociology of Human Resources</b> <i>Stanislava Holíková</i>	KZ	4	8B	Z	PV
621W1TH	<b>Aircraft Technical Handling</b> <i>Slobodan Stoji</i>	KZ	4	8B	Z	PV
621W1UT	<b>Airports Maintenance</b>	KZ	4	8	L	PV
614W1UP	<b>Editing of Theses in MS Word</b>	KZ	4	8B	L	PV

**Characteristics of the courses of this group of Study Plan: Code=PVP KOMBI 17-18 Name=PVP pro bak .KOMBI 17-18 (4.LS+5.ZS+6.LS) pro LOG a LED obory**

617W1AF	Alternative Forms of Transportation Project Financing	KZ	4
There will be specified such forms of financing in transportation, where the public sector body perform the final debtor, i. e. debtor payments come from its budget, but the final debtor is not a direct participant of the transaction and it is not the counterparty of the financial institute which provides the funding. Issue of securities as an alternative source of transportation project.			
621W1BC	Aviation safety and security	KZ	4
History of safety and security development in aviation. Modern tools for safety and security management. Research and development of safe and secure systems.			
615W1BO	Work Safety and Health Protection in Transportation	KZ	4
Fundamental legislative, definition of terms, risks and possible health damage, working conditions and health protection with focus on transportation. Health protection programmes, health insurance of home and foreign business trips, statistics, working practice.			
617W1EV	Public Sector Economy	KZ	4
Economic and financial theory of public sector, public choice theory, externalities, decisions about public finance allocation, economic assesment of public projects (CBA, MCA, CEA), tax system of the CR, state budget, management of public projects a their economic efficiency assessment, way of elaboration of PPP projects, funding from EU funds, program HDM-4.			
621W1FN	Factors Affecting the Rate of Accidents in Aviation	KZ	4
Introduction. The scope of international and national organizations in civil aviation. The scope of the investigation organisations within the state and international committees. Analysis and interpretation of ICAO Annexes 13 and 19. Analysis and interpretation of the Regulation (EC), Regulation (EU). Human factor. Utilization of information from the investigation reports.			
614W1HW	Computer Hardware	KZ	4
Design combinational and sequential logical circuits and their implementation on FPGA, VHDL language. Computer architecture, structures of computer components - controller, ALU, memories, I/O subsystem, typical interfaces and buses (PCI Express, I2C, SPI, USB).			
615W1HD	History of City Mass Transport	KZ	4
History of city mass transport in the world, development of tram, bus and trolley-bus systems. History of transport networks in the world, current trends and developments of tariff and clearance systems. History of city transport in Prague and Brno. History of tram, bus and trolley-bus operation systems in the Czech Republic and Slovakia.			
615W1HE	Work Hygiene and Ergonomics in Traffic	KZ	4
Basic knowledge of occupational hygiene and ergonomics, and their application in transport. Working environment factors, and the influence of these factors on health of workers. Creation and protection of working conditions that do not damage public health. Mutual links man-machine-environment. Adaptation of technology to possibilities and skills of man. Practical examples from the field of transportation; relevant legislative.			
621W1LA	Aerobatics	KZ	4
Methodology of flying aerobatic figures. Aerodynamics and flight mechanics of aerobatic figures. Aerobatic training syllabi and aerobatic competitions. Creating an aerobatic sequence. Safety in aerobatics, accidents related to aerobatics. Physiological aspects of flying aerobatics. Aircraft structure loads and construction fatigue strength of aerobatic aircraft. Upset recovery training (UPRT) for commercial pilots and related accidents.			
621W1LR	Radio Technology in Aviation	KZ	4
Electric signals and the wave spectrum. Analog and digital modulations. Noises. Filters. Resonance circuits. Electromagnetic field. Electromagnetic wave propagation. Wave ranges in aviation, radiation and reception of electromagnetic field. Antennas in aviation, receivers and transmitters.			
617W1LL	Logistics of Passenger and Freight Air Transportation	KZ	4
Logistics airline passenger and cargo. Aircraft and airport terminals for passenger and cargo transport. Airlines in terms of logistics systems. Aerial transport process passengers and air cargo. Information systems in air transport. Global distribution systems.			
621W1MZ	Managerial Ethics	KZ	4
The basic terminology of managerial ethics. Basics of etiquette and rules of social contact. Social events. Etiquette of working contacts. The art of presentation and negotiation. Personal image. Diplomatic protocol. Managerial ethics. Business ethics.			
617W1MD	Marketing in Transportation	KZ	4
General principles of marketing applied to transport issues, marketing tools suitable for transport as a service, specifics of public passenger transport and the resulting differences in the application of marketing.			
617W1ND	Maritime Transportation	KZ	4
History and importance of the maritime transportation, theoretical discipline in maritime transportation, seafaring vessels, maritime ports and their utilization, inland logistic centre and maritime ports, transport corridors and link by maritime, river and rail transport I and II, global maritime corridors, logistics of maritime transportation, maritime transportation and smart containers, ITS in maritime transport.			
621W1OL	Security of Air Transport	KZ	4
The development of civil aviation. Definitions and regulations. History of acts of unlawful interference. Terrorism in aviation. National security program. Crisis management. Protection at airports - operational procedures. Modern means of protection and control.			
617W1OF	Personal Finance	KZ	4
Personal finance (budget, financing of basic living needs), debt (loans and credits, payment instruments, interest and fees, debt trap), financing of housing (rent, mortgage, savings, consumer loans, refinancing), savings and investments (investment horizon, return, risk, investment strategy), insurance (insurance types, suitability and adequacy), securing the future (retirement savings and insurance).			
617W1PM	Personnel Management	KZ	4
Human sources, work group, man as personality, planning, choice, evaluation and education of human sources, work adaptation, teamwork, intercultural communication.			
614W1PZ	Advanced Data Processing in Spreadsheets	KZ	4
Students will be familiar with principles of working in a spreadsheet. Graphic layout of the table appearance, formatting of numbers, insertion of formulas and functions, including addressing, error detection. Working with large spreadsheets, filters, advanced filters, database functions. Pivot tables and charts, conditional formatting, solution finding, solver, macros, data analysis. Examples and questions from various companies and training.			
614W1PJ	C Programming Language	KZ	4
C programming language. Preprocessor, basics of the C language (data types, syntax, commands), functions, pointers, dynamical memory allocation, string, files, structures and unions. Implementations of abstract data types (FIFO, LIFO, list), programming techniques (sorting, searching, recursion), using bitwise operators.			
616W1PV	Operation, Construction and Maintenance of Vehicles	KZ	4
Methods of vehicle production. Vehicle maintenance. Vehicle diagnostics. Maintenance and repair plans. Engine maintenance and emission measurement. Transmission mechanism. General principles of engine diagnostics.			
621W1RZ	Human Resources Management	KZ	4
The position of human resources in the organization and related disciplines file. Substance, importance and challenges of human resources management. Internal and external environment of human resource management. Human resource planning. Search, recruitment and selection of employees. Motivation, evaluation and remuneration of staff. Positioning, dismissal and redundancies of employees. Education of employees. Planning career management.			

617W1ST	Titan Simulation	KZ	4
Titan is a management game simulating the business decisions. Lets 2-8 student groups to produce and compete in the market with the same product. Students set a price and determine the quantity and capacity of production, plan budgets for marketing, research and development. They become familiar with the consequences of their decisions by the form of financial corporate reports and they use this information for other business decisions.			
617W1SL	Sociology of Human Resources	KZ	4
Human resources and their importance, work group as a special kind of social group, communication, personal management, modern management, human resources planning, culture of the organization.			
621W1TH	Aircraft Technical Handling	KZ	4
Aircraft towing and pushing tractors. GPU. Air conditioning and heating units. Aircraft fuel equipment. De-icing and anti-icing units. Loading and unloading units. Equipment for passengers onboarding and offboarding. Operational processes of aircraft technical handling and regulations. Modernization and technical progress.			
621W1UT	Airports Maintenance	KZ	4
Summer airport maintenance. Summer maintenance equipment. Winter airport maintenance. Winter maintenance equipment. De-icing / anti-icing of aircraft. De-icing / anti-icing liquid. Operating procedures, limitations, practices.			
614W1UP	Editing of Theses in MS Word	KZ	4
Students will be introduced to the principles of creating and editing large documents and basic typographic rules. They will properly apply styles, create tables of contents, lists of figures, tables, graphs, etc. Footnotes, captions, index. They practice corrections of finished documents. The goal is to prepare students for seamless editing dissertations and theses, so that they are able to concentrate mainly on writing a thesis.			

Name of the block: Jazyky

Minimal number of credits of the block: 6

The role of the block: J

Code of the group: JZ 2 K (5.-6.SEM)

Name of the group: Jazyky KOMBI bak. pro 5. a 6. sem. (2.cizí jazyk) - pro B3710

Requirement credits in the group: In this group you have to gain 6 credits

Requirement courses in the group: In this group you have to complete 2 courses

Credits in the group: 6

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) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
615JZ3F	Foreign Language - French 3	Z	3	CP4C+10B	Z	J
615JZ3I	Foreign Language - Italian 3	Z	3	CP4C+10B	Z	J
615JZ3N	Foreign Language - German 3 <i>René Skalický</i>	Z	3	CP4C+10B	Z	J
615JZ3S	Foreign Language - Spanish 3	Z	3	CP4C+10B	Z	J
615JZ3R	Foreign Language - Russian 3 <i>Vilma Gottwaldová</i>	Z	3	CP4C+10B	Z	J
615JZ4F	Foreign Language - French 4	Z,ZK	3	CP4C+10B	L	J
615JZ4I	Foreign Language - Italian 4	Z,ZK	3	CP4C+10B	L	J
615JZ4N	Foreign Language - German 4 <i>René Skalický</i>	Z,ZK	3	CP4C+10B	L	J
615JZ4R	Foreign Language - Russian 4 <i>Vilma Gottwaldová</i>	Z,ZK	3	CP4C+10B	L	J
615JZ4S	Foreign Language - Spanish 4	Z,ZK	3	CP4C+10B	L	J

Characteristics of the courses of this group of Study Plan: Code=JZ 2 K (5.-6.SEM) Name=Jazyky KOMBI bak. pro 5. a 6. sem. (2.cizí jazyk) - pro B3710

615JZ3F	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.			
615JZ3I	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.			
615JZ3N	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.			
615JZ3S	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.			



615JZ3R	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.			
615JZ4F	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.			
615JZ4I	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.			
615JZ4N	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.			
615JZ4R	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.			
615JZ4S	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.			

### List of courses of this pass:

Code	Name of the course	Completion	Credits
611CAL1	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.			
611CAL2	Calculus 2	Z,ZK	5
Antiderivative, 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.			
611FY1	Physics 1	Z,ZK	4
Kinematics, particle dynamics, dynamics of particle systems and rigid body. Continuum mechanics, thermodynamics, electric field, directed electric current.			
611GIE	Geometry	KZ	3
Orthographic and oblique projections, linear perspective. Topographic surfaces and their orthogonal projection. Differential geometry of curves - parameterization, 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.			
611LA	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.			
611MSP	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).			
611STAS	Statistics	Z,ZK	5
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.			
612MDE	Transport Models and Transport Excesses	Z,ZK	3
Parameters of the traffic flow and methods for their measurement. Models of the traffic flow, communications load, line and urban systems. Theory of queues, shock waves. Quality of transport and its assessment. Statistical characteristics of transport. Transport excesses, their analysis, the causes, identify and minimize the consequences. Improving of transport safety and fluency.			
612PPOK	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.			
612ZTS	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.			
612ZYDK	Introduction to Transportation Engineering	Z,ZK	3
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.			

614AS	Algorithm and Data Structures	KZ	2
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.			
614DATS	Database Systems	KZ	2
Basic concepts of database systems, conceptual model, relational data model, the principles of normal forms, relational database design, security and integrity of data, database queries, relational algebra, SQL language, client / server, multilayer architectures, distributed database systems. Access to data via the WWW.			
614PRG	Programming	KZ	2
Algorithm development, methods of structured programming, high-level programming languages, basics of C programming languages (types, variables, conditions, cycles, arrays, functions), programming techniques, complexity.			
614W1HW	Computer Hardware	KZ	4
Design combinational and sequential logical circuits and their implementation on FPGA, VHDL language. Computer architecture, structures of computer components - controller, ALU, memories, I/O subsystem, typical interfaces and buses (PCI Express, I2C, SPI, USB).			
614W1PJ	C Programming Language	KZ	4
C programming language. Preprocessor, basics of the C language (data types, syntax, commands), functions, pointers, dynamical memory allocation, string, files, structures and unions. Implementations of abstract data types (FIFO, LIFO, list), programming techniques (sorting, searching, recursion), using bitwise operators.			
614W1PZ	Advanced Data Processing in Spreadsheets	KZ	4
Students will be familiar with principles of working in a spreadsheet. Graphic layout of the table appearance, formatting of numbers, insertion of formulas and functions, including addressing, error detection. Working with large spreadsheets, filters, advanced filters, database functions. Pivot tables and charts, conditional formatting, solution finding, solver, macros, data analysis. Examples and questions from various companies and training.			
614W1UP	Editing of Theses in MS Word	KZ	4
Students will be introduced to the principles of creating and editing large documents and basic typographic rules. They will properly apply styles, create tables of contents, lists of figures, tables, graphs, etc. Footnotes, captions, index. They practice corrections of finished documents. The goal is to prepare students for seamless editing dissertations and theses, so that they are able to concentrate mainly on writing a thesis.			
615DPLG	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.			
615JZ1A	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 stylistic forms. Oral and written presentation of original research. Academic text principles and reading comprehension. Principles of rhetoric.			
615JZ2A	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 stylistic forms. Oral and written presentation of original research. Academic text principles and reading comprehension. Principles of rhetoric.			
615JZ3F	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.			
615JZ3I	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.			
615JZ3N	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.			
615JZ3R	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.			
615JZ3S	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.			
615JZ4F	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.			
615JZ4I	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.			
615JZ4N	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.			
615JZ4R	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.			

615JZ4S	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.			
615W1BO	Work Safety and Health Protection in Transportation	KZ	4
Fundamental legislative, definition of terms, risks and possible health damage, working conditions and health protection with focus on transportation. Health protection programmes, health insurance of home and foreign business trips, statistics, working practice.			
615W1HD	History of City Mass Transport	KZ	4
History of city mass transport in the world, development of tram, bus and trolley-bus systems. History of transport networks in the world, current trends and developments of tariff and clearance systems. History of city transport in Prague and Brno. History of tram, bus and trolley-bus operation systems in the Czech Republic and Slovakia.			
615W1HE	Work Hygiene and Ergonomics in Traffic	KZ	4
Basic knowledge of occupational hygiene and ergonomics, and their application in transport. Working environment factors, and the influence of these factors on health of workers. Creation and protection of working conditions that do not damage public health. Mutual links man-machine-environment. Adaptation of technology to possibilities and skills of man. Practical examples from the field of transportation; relevant legislative.			
616UDOP	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.			
616W1PV	Operation, Construction and Maintenance of Vehicles	KZ	4
Methods of vehicle production. Vehicle maintenance. Vehicle diagnostics. Maintenance and repair plans. Engine maintenance and emission measurement. Transmission mechanism. General principles of engine diagnostics.			
617TEDK	Transport Technology and Logistics	KZ	4
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.			
617TGA	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.			
617W1AF	Alternative Forms of Transportation Project Financing	KZ	4
There will be specified such forms of financing in transportation, where the public sector body perform the final debtor, i. e. debtor payments come from its budget, but the final debtor is not a direct participant of the transaction and it is not the counterparty of the financial institute which provides the funding. Issue of securities as an alternative source of transportation project.			
617W1EV	Public Sector Economy	KZ	4
Economic and financial theory of public sector, public choice theory, externalities, decisions about public finance allocation, economic assesment of public projects (CBA, MCA, CEA), tax system of the CR, state budget, management of public projects a their economic efficiency assessment, way of elaboration of PPP projects, funding from EU funds, program HDM-4.			
617W1LL	Logistics of Passenger and Freight Air Transportation	KZ	4
Logistics airline passenger and cargo. Aircraft and airport terminals for passenger and cargo transport. Airlines in terms of logistics systems. Aerial transport process passengers and air cargo. Information systems in air transport. Global distribution systems.			
617W1MD	Marketing in Transportation	KZ	4
General principles of marketing applied to transport issues, marketing tools suitable for transport as a service, specifics of public passenger transport and the resulting differences in the application of marketing.			
617W1ND	Maritime Transportation	KZ	4
History and importance of the maritime transportation, theoretical discipline in maritime transportation, seafaring vessels, maritime ports and their utilization, inland logistic centre and maritime ports, transport corridors and link by maritime, river and rail transport I and II, global maritime corridors, logistics of maritime transportation, maritime transportation and smart containers, ITS in maritime transport.			
617W1OF	Personal Finance	KZ	4
Personal finance (budget, financing of basic living needs), debt (loans and credits, payment instruments, interest and fees, debt trap), financing of housing (rent, mortgage, savings, consumer loans, refinancing), savings and investments (investment horizon, return, risk, investment strategy), insurance (insurance types, suitability and adequacy), securing the future (retirement savings and insurance).			
617W1PM	Personnel Management	KZ	4
Human sources, work group, man as personality, planning, choice, evaluation and education of human sources, work adaptation, teamwork, intercultural communication.			
617W1SL	Sociology of Human Resources	KZ	4
Human resources and their importance, work group as a special kind of social group, communication, personal management, modern management, human resources planning, culture of the organization.			
617W1ST	Titan Simulation	KZ	4
Titan is a management game simulating the business decisions. Lets 2-8 student groups to produce and compete in the market with the same product. Students set a price and determine the quantity and capacity of production, plan budgets for marketing, research and development. They become familiar with the consequences of their decisions by the form of financial corporate reports and they use this information for other business decisions.			
618MTY	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.			
618PZP	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.			
618SAT	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.			
618TED	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.			

620SYSA	<b>Systems Analysis</b>	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.			
620UITS	<b>Introduction to Intelligent Transport Systems</b>	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.			
621ELED	<b>Air Transport Economy</b>	Z,ZK	4
Economic benefits of air transport. Costs of airline. Revenue management. Fuel management. Currencies development. Demand and supply. Rates in air transport. Aircraft selection. Fleet assignment. Aging of aircraft. Airlines bankruptcy. Crew planning. Marketing in Air Transport. Cargo tariff and rates. Air network configuration.			
621LAG1	<b>English for Aviation 1</b>	KZ	3
Familiarity with the terminology used in civil aviation in the general context and emphasizing the ability to receive information only in English.			
621LAG2	<b>English in Aviation 2</b>	KZ	3
Terminology in the sphere of aircraft construction, principles of flight, aircraft engines, instruments and systems.			
621LCM	<b>Aircraft Engines</b>	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 turbofan engines, basic construction modules, and their operational characteristics. Engine control.			
621LGP	<b>Legislation and Operational Regulations</b>	Z,ZK	5
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. Introduction to the European Parliament and Council Regulation (EC), Commission Regulation (EU) and the Decisions of the Executive Director of EASA.			
621LIVO	<b>Human Performance and Limitations</b>	Z,ZK	5
Human performance & limitations, aptibility & competence, accident statistics, flight safety, basics of flight physiology, man & environment, breathing & circulation, sensory system, health & hygiene, health preservation, intoxication, incapacitation, basics of flight psychology, human information processing, memory & learning, theory & model of human error, body rhythms & sleep, stress, fatigue, working methods.			
621LL1	<b>Aircraft 1</b>	KZ	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.			
621LTA2	<b>Aircraft 2</b>	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.			
621LTN	<b>Air Navigation</b>	Z,ZK	2
Earth - its shape, parameters and properties. Aeronautical charts and their use. Measuring time. Dead reckoning. Radionavigation aids. Global navigation satellite systems. Air traffic services routes and their design.			
621LTTE	<b>Aerodromes</b>	Z,ZK	4
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.			
621MRG	<b>Meteorology</b>	KZ	3
Structure of atmosphere. Vertical stratification. Pressures QNH, QFE, QFF, QME. Instability. Atmospheric fronts. Atmospheric rainfall, origin fission. Turbulence. Powers causing wind. Cyclone and anticyclone. Gradient wind. Geostrofical and geocyklostrofical wind. Visibilities in air transport. Dangerous meteorological aspects. Meteorological maps. Climatology. Circulation. Intertropical front. Meteorological informations.			
621OBP	<b>Airline Business and Operations</b>	Z,ZK	3
Airline business and operation abbreviations and terminology. Civil aviation structure in the Czech republic. Act No. 49/1997 Coll., on civil aviation. Air transport regulations ICAO, EU. IATA, ICAO, ECAC, JAA, EUROCONTROL. Air operators. Air transport distribution. Global distribution and reservation systems. Agreements among air operators. Air traffic manuals and publications. Passenger and cargo air transport.			
621PAP	<b>Flight Planning and Performance</b>	Z,ZK	4
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.			
621PDLE	<b>Airport Design and Operation</b>	KZ	3
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.			
621PJE	<b>Aircraft Instruments</b>	KZ	2
Overview of aircraft instrumentation and its principles and construction, aircraft electrical systems, engine measuring and monitoring systems, air data computer, icing monitoring systems, gyroscopic indicators, inertial and radio navigation means, communication means, data recorders, complex flight and navigation data processing systems.			
621RILP	<b>Air Traffic Control</b>	Z	2
Air traffic services and their distribution. Organization of air traffic, flow and capacity management. Airspace management. System support for aircraft flying through space. Flight plan, the form, content. Separation of aircraft. Reports of air traffic services, the form, content. Harmonization and integration of ATC. CFMU and its subsystems. Flexible use of airspace - FUA. RVSM, RNP. New trends in the area of ATC.			
621ULCT	<b>Aircraft Maintenance</b>	Z	2
Aircraft operations and technical operations. Maintenance and work processes. Defects search methods, status check diagnostic tools. Selection and qualification of aviation personnel. Basic documentation for maintenance. Optimization of time maintenance intervals. Regulation no. 1321/2014 Part 145. Human factors of aircraft maintenance. Regulation of director EASA for aircraft maintenance. Seminars will be focused on practical application.			
621W1BC	<b>Aviation safety and security</b>	KZ	4
History of safety and security development in aviation. Modern tools for safety and security management. Research and development of safe and secure systems.			
621W1FN	<b>Factors Affecting the Rate of Accidents in Aviation</b>	KZ	4
Introduction. The scope of international and national organizations in civil aviation. The scope of the investigation organisations within the state and international committees. Analysis and interpretation of ICAO Annexes 13 and 19. Analysis and interpretation of the Regulation (EC), Regulation (EU). Human factor. Utilization of information from the investigation reports.			

621W1LA	<b>Aerobatics</b>	KZ	4
Methodology of flying aerobatic figures. Aerodynamics and flight mechanics of aerobatic figures. Aerobatic training syllabi and aerobatic competitions. Creating an aerobatic sequence. Safety in aerobatics, accidents related to aerobatics. Physiological aspects of flying aerobatics. Aircraft structure loads and construction fatigue strength of aerobatic aircraft. Upset recovery training (UPRT) for commercial pilots and related accidents.			
621W1LR	<b>Radio Technology in Aviation</b>	KZ	4
Electric signals and the wave spectrum. Analog and digital modulations. Noises. Filters. Resonance circuits. Electromagnetic field. Electromagnetic wave propagation. Wave ranges in aviation, radiation and reception of electromagnetic field. Antennas in aviation, receivers and transmitters.			
621W1MZ	<b>Managerial Ethics</b>	KZ	4
The basic terminology of managerial ethics. Basics of etiquette and rules of social contact. Social events. Etiquette of working contacts. The art of presentation and negotiation. Personal image. Diplomatic protocol. Managerial ethics. Business ethics.			
621W1OL	<b>Security of Air Transport</b>	KZ	4
The development of civil aviation. Definitions and regulations. History of acts of unlawful interference. Terrorism in aviation. National security program. Crisis management. Protection at airports - operational procedures. Modern means of protection and control.			
621W1RZ	<b>Human Resources Management</b>	KZ	4
The position of human resources in the organization and related disciplines. Substance, importance and challenges of human resources management. Internal and external environment of human resource management. Human resource planning. Search, recruitment and selection of employees. Motivation, evaluation and remuneration of staff. Positioning, dismissal and redundancies of employees. Education of employees. Planning career management.			
621W1TH	<b>Aircraft Technical Handling</b>	KZ	4
Aircraft towing and pushing tractors. GPU. Air conditioning and heating units. Aircraft fuel equipment. De-icing and anti-icing units. Loading and unloading units. Equipment for passengers onboarding and offboarding. Operational processes of aircraft technical handling and regulations. Modernization and technical progress.			
621W1UT	<b>Airports Maintenance</b>	KZ	4
Summer airport maintenance. Summer maintenance equipment. Winter airport maintenance. Winter maintenance equipment. De-icing / anti-icing of aircraft. De-icing / anti-icing liquid. Operating procedures, limitations, practices.			
621ZALD	<b>Basics of Air Transport</b>	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.			
621ZT	<b>ATM Systems</b>	ZK	2
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.			
621ZYL1	<b>Principles of Flight 1</b>	Z,ZK	5
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.			
621ZYL2	<b>Principles of Flight 2</b>	Z,ZK	5
Ways of producing thrust, propeller, jet propulsion, thrust and momentum, propulsion efficiency, aerodynamics of fixed and variable pitch propeller, propeller operation modes, propeller airstream effect, gyroscopic effect, balance of forces in horizontal flight, glide and landing, performances, take off and climb, acceleration, positive load, manoeuvres, stability and controllability, transsonic speeds.			
623BDIS	<b>Safety Technologies of Transportation and Information Systems</b>	KZ	3
Safety of transportation means - principles, testing, evaluation. Safety of infrastructures, critical structures, crisis scenarios. Safety of information systems and their robustness.			

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

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