Study plan

Name of study plan: LED bak.prez.18/19

Faculty/Institute/Others:
Department:
Branch of study guaranteed by the department: Air Transport
Garantor of the study branch: doc. Ing. Peter Vittek, Ph.D.
Program of study: Technology in Transportation and Telecommunications
Type of study: Bachelor full-time
Required credits: 180
Elective courses credits: 0
Sum of credits in the plan: 180
Note on the plan:

Name of the block: Semestrální projekt
Minimal number of credits of the block: 6
The role of the block: ZP

Code of the group: XB 4,5,6 13/14
Name of the group: Projekty bak. 4.5.6.sem. 13/14
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 3 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)*** *Tutors,* ***authors*** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
17X31	**Project 1** *Rudolf Vávra, Petr Fridrišek, Dominik Mazel, Stanislav Metelka, Václav Baroch, Dušan Teichmann, Edvard Březina, Michal Drábek, Tomáš Horák, ...*	Z	2	0P+1C	L	ZP
12X31	**Project 1** *Zuzana Čarská, Dagmar Kočárková, Karolína Moudrá, Kristýna Neubergová, Martin Jacura, Vojtěch Novotný, Ondřej Trešl, David Vodák, Tomáš Javořík, ...*	Z	2	0P+1C	L	ZP
16X31	**Project 1** *Petr Bouchner, Přemysl Toman, Josef Mík*	Z	2	0P+1C	L	ZP
18X31	**Project 1** *Daniel Kytýř, Tomáš Doktor, Jan Šleichrt*	Z	2	0P+1C	L	ZP
11X31	**Project 1**	Z	2	0P+1C	L	ZP
22X31	**Project 1** *Michal Frydrýn, Luboš Nouzovský, Zdeněk Svatý, Karel Kocián*	Z	2	0P+1C	L	ZP
14X31	**Project 1** *Jana Kaliková, Jan Krčál, Tomáš Zelinka, Martin Šrotýř, Zdeněk Lokaj, Tomáš Brandejský, Vít Fábera, Jan Zelenka, Ota Hajzler*	Z	2	0P+1C	L	ZP
23X31	**Project 1** ***Milena Macková***	Z	2	0P+1C	L	ZP
20X31	**Project 1** *Patrik Horažďovský*	Z	2	0P+1C	L	ZP
15X31	**Project 1** *Eva Rezlerová*	Z	2	0P+1C	L	ZP
21X31	**Project 1** *Lenka Hanáková, Tereza Topková, Vladimír Socha, Helena Bínová, Jakub Hospodka, Šárka Hulínská, Iveta Kameníková, Jakub Kraus, Andrej Lališ, ...*	Z	2	0P+1C	L	ZP
16X32	**Project 2** *Josef Mík, Petr Bouchner*	Z	2	0P+2C	Z	ZP
15X32	**Project 2** *Eva Rezlerová*	Z	2	0P+2C	Z	ZP
14X32	**Project 2** *Jana Kaliková, Jan Krčál, Tomáš Zelinka, Martin Šrotýř, Zdeněk Lokaj, Ota Hajzler, Eva Fantová, Filip Müller*	Z	2	0P+2C	Z	ZP
12X32	**Project 2** *Zuzana Čarská, Dagmar Kočárková, Karolína Moudrá, Kristýna Neubergová, Martin Jacura, Vojtěch Novotný, Ondřej Trešl, David Vodák, Tomáš Javořík, ...*	Z	2	0P+2C	Z	ZP

11X32	**Project 2**	Z	2	0P+2C	Z	ZP
23X32	**Project 2** *Milena Macková, Václav Jirovský*	Z	2	0P+2C	Z	ZP
22X32	**Project 2** *Michal Frydrýn, Luboš Nouzovský, Zdeněk Svatý, Karel Kocián, Tomáš Mičunek*	Z	2	0P+2C	Z	ZP
21X32	**Project 2**	Z	2	0P+2C	Z	ZP
20X32	**Project 2** *Patrik Horažďovský, Jiří Růžička, Pavel Hrubeš, Martin Leso, Petr Bureš, Martin Langr*	Z	2	0P+2C	Z	ZP
18X32	**Project 2**	Z	2	0P+2C	Z	ZP
17X32	**Project 2** *Václav Baroch, Dušan Teichmann, Edvard Březina, Michal Drábek, Tomáš Horák, Vít Janoš, Milan Kříž, Olga Mertlová, Zdeněk Michl, ...*	Z	2	0P+2C	Z	ZP
23X33	**Project 3**	Z	2	0P+1C	L	ZP
20X33	**Project 3**	Z	2	0P+1C	L	ZP
12X33	**Project 3** *Zuzana Čarská, Dagmar Kočárková, Karolína Moudrá, Kristýna Neubergová, Martin Jacura, Vojtěch Novotný, Ondřej Trešl, David Vodák, Tomáš Javořík, ...*	Z	2	0P+1C	L	ZP
22X33	**Project 3** *Michal Frydrýn, Luboš Nouzovský, Zdeněk Svatý, Karel Kocián*	Z	2	0P+1C	L	ZP
14X33	**Project 3** *Tomáš Zelinka, Martin Šrotýř, Zdeněk Lokaj, Ota Hajzler*	Z	2	0P+1C	L	ZP
16X33	**Project 3** *Petr Bouchner, Přemysl Toman, Josef Mík, Adam Orlický, Jaroslav Machan*	Z	2	0P+1C	L	ZP
11X33	**Project 3**	Z	2	0P+1C	L	ZP
15X33	**Project 3** *Eva Rezlerová*	Z	2	0P+1C	L	ZP
17X33	**Project 3** *Václav Baroch, Dušan Teichmann, Edvard Březina, Michal Drábek, Tomáš Horák, Vít Janoš, Milan Kříž, Olga Mertlová, Zdeněk Michl, ...*	Z	2	0P+1C	L	ZP
21X33	**Project 3** *Lenka Hanáková, Vladimír Socha, Helena Bínová, Jakub Hospodka, Šárka Hulínská, Iveta Kameníková, Jakub Kraus, Andrej Lališ, Roman Matyáš, ...*	Z	2	0P+1C	L	ZP
18X33	**Project 3**	Z	2	0P+1C	L	ZP

Characteristics of the courses of this group of Study Plan: Code=XB 4,5,6 13/14 Name=Projekty bak. 4.5.6.sem. 13/14

17X31	Project 1	Z	2
12X31	Project 1	Z	2
16X31	Project 1	Z	2
18X31	Project 1	Z	2
11X31	Project 1	Z	2
22X31	Project 1	Z	2
14X31	Project 1	Z	2
23X31	Project 1	Z	2
20X31	Project 1	Z	2
15X31	Project 1	Z	2
21X31	Project 1	Z	2
16X32	Project 2	Z	2
15X32	Project 2	Z	2
14X32	Project 2	Z	2
12X32	Project 2	Z	2
11X32	Project 2	Z	2
23X32	Project 2	Z	2
22X32	Project 2	Z	2
21X32	Project 2	Z	2
20X32	Project 2	Z	2
18X32	Project 2	Z	2
17X32	Project 2	Z	2
23X33	Project 3	Z	2
20X33	Project 3	Z	2
12X33	Project 3	Z	2
22X33	Project 3	Z	2
14X33	Project 3	Z	2
16X33	Project 3	Z	2
11X33	Project 3	Z	2
15X33	Project 3	Z	2
17X33	Project 3	Z	2
21X33	Project 3	Z	2

18X33	Project 3	Z	2

Name of the block: Compulsory courses
Minimal number of credits of the block: 162
The role of the block: Z

Code of the group: 1.S.BP 17/18
Name of the group: 1.sem.bak.prez. od 17/18
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 11 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
11CAL1	**Calculus 1** *Magdalena Hykšová, Ondřej Navrátil, Bohumil Kovář, Pavel Provinský, Tomáš Třasák, Olga Vraštilová*	Z,ZK	7	2P+4C	Z	z
11LA	**Linear Algebra** *Pavel Provinský, Martina Bečvářová, Lucie Kárná, Jan Přikryl*	Z,ZK	3	2P+1C	Z	z
12ZYDI	**Introduction to Transportation Engineering** *Zuzana Čarská, Dagmar Kočárková*	Z,ZK	2	1P+1C	Z	z
18MTY	**Materials Science and Engineering** *Jan Šleichrt, Vít Malinovský, Jaroslav Valach, Jan Šleichrt, Marcel Adorna, Jan Falta, Jan Falta, Václav Rada, Václav Rada, ... Jaroslav Valach (Gar.)*	Z,ZK	3	2P+1C	Z	z
11GIE	**Geometry** *Pavel Provinský, Oldřich Hykš, Šárka Voráčová*	KZ	3	2P+2C	Z	z
14ASD	**Algorithm and Data Structures** *Zdeněk Lokaj, Vít Fábera, Jan Zelenka, Michal Jeřábek, Petr Hnyk*	KZ	3	0P+2C	Z	z
14KSP	**Constructing with Computer Aid** *Filip Müller, Martin Brumovský, Lukáš Kozel, Radek Kratochvíl, Drahomír Schmidt, Lukáš Svoboda, Monika Stambolidis*	KZ	2	0P+2C	Z	z
18TED	**Technical Documentation** *Vít Malinovský, Tomáš Fíla, Jitka Řezníčková*	KZ	2	1P+1C	Z	z
15DPLG	**Transportation Psychology** *Jan Feit, Jana Štikarová*	Z	2	2P+0C	Z	z
16UDOP	**Introduction into Vehicles** *Petr Bouchner, Přemysl Toman, Josef Mík, Zuzana Radová Petr Bouchner (Gar.)*	Z	2	2P+0C	Z	z
TV-1	**Physical Education**	Z	1		Z	z

Characteristics of the courses of this group of Study Plan: Code=1.S.BP 17/18 Name=1.sem.bak.prez. od 17/18

11CAL1	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.

11LA	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.

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.

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.

11GIE	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.

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 possibilites, AutoCAD environment profiles, drawings with raster foundaments).

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.

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.			
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.			
TV-1	Physical Education	Z	1

Code of the group: 2.S.BP 17/18
Name of the group: 2.sem.bak.prez. od 17/18
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
11CAL2	**Calculus 2** *Magdalena Hykšová, Ondřej Navrátil, Tomáš Třasák, Olga Vraštilová, Martina Bečvářová, Oldřich Hykš* ***Magdalena Hykšová*** *Ondřej Navrátil (Gar.)*	Z,ZK	5	2P+3C+20B	L	z
11STAT	**Statistics** *Pavel Provinský, Šárka Voráčová, Ivan Nagy, Pavla Pecherková, Evženie Uglickich, Šárka Jozová* ***Ivan Nagy***	Z,ZK	4	2P+2C+12B	L	z
12ZTS	**Railway Lines and Stations** *Martin Jacura, Vojtěch Novotný, Ondřej Trešl, Tomáš Javořík, Lukáš Týfa, Martin Vaněk*	Z,ZK	4	2P+2C+10B	L	z
18SAT	**Structural Analysis** *Daniel Kytýř, Tomáš Doktor, Jan Šleichrt, Marcel Adorna, Jan Falta, Václav Rada, Václav Rada, Jitka Řezníčková, Jan Vyčichl, ...*	Z,ZK	4	2P+2C+14B	L	z
20SYSA	**Systems Analysis** *Jiří Růžička, Petr Bureš, Zuzana Bělinová*	Z,ZK	5	2P+2C+14B	L	z
14PRG	**Programming** *Jana Kaliková, Martin Šrotýř, Zdeněk Lokaj, Vít Fábera, Jan Zelenka, Michal Jeřábek, Lukáš Svoboda, Radek Holý, Marek Kalika Jana Kaliková (Gar.)*	KZ	2	0P+2C+8B	L	z
17TEDL	**Transport Technology and Logistics** *Michal Drábek, Vít Janoš, Milan Kříž, Zdeněk Michl, Jiří Pospíšil*	KZ	3	2P+1C	L	z
21ZALD	**Basics of Air Transport** *Tereza Topková, Michaela Šerlová, Sébastien Lán, Sarah Van Den Bergh, Adam Kleczatský*	KZ	2	0P+2C+8B	L	z
TV-2	**Physical Education**	Z	1		L	z

Characteristics of the courses of this group of Study Plan: Code=2.S.BP 17/18 Name=2.sem.bak.prez. od 17/18

11CAL2	Calculus 2	Z,ZK	5
Antiderivative, 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.			
11STAT	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.			
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.			
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.			
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.			
14PRG	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.			
17TEDL	Transport Technology and Logistics	KZ	3
Basic terms in transport technology and logistics, particular steps of transport planning, line planning, timetabling, planning in pasanger 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 aplication using various transport modus.			
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.			

TV-2	Physical Education	Z	1

Code of the group: 3.S.BP 18/19
Name of the group: 3.sem.bak.prez. od 18/19
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
11FYZ	**Physics** *Zuzana Malá, Tomáš Vítů, Antonio Cammarata, Kosta Simonovic, Paolo Nicolini, Marek Honců Zuzana Malá (Gar.)*	Z,ZK	5	2P+2C	Z	z
12MDE	**Transport Models and Transport Excesses** *Josef Kocourek, Milan Dont*	Z,ZK	3	2P+1C	Z	z
17TGA	**Graph Theory and its Applications in Transport** *Dušan Teichmann, Denisa Mocková, Alena Rybičková Alena Rybičková (Gar.)*	Z,ZK	4	2P+2C	Z	z
18PZP	**Elasticity and Strength** *Daniel Kytýř, Tomáš Doktor, Jan Šleichrt, Jan Šleichrt, Marcel Adorna, Jan Falta, Jan Falta, Jitka Řezníčková, Jan Vyčichl, ... Ondřej Jiroušek (Gar.)*	Z,ZK	3	2P+1C	Z	z
20UITS	**Introduction to Intelligent Transport Systems** *Tomáš Zelinka, Patrik Horažďovský, Jiří Růžička, Pavel Hrubeš, Martin Langr, Zuzana Purkrábková, Vladimír Faltus Vladimír Faltus (Gar.)*	Z,ZK	7	3P+2C	Z	z
12PPOK	**Designing Roads, Highways and Motorways** *Jiří Čarský, Tomáš Padělek, Jan Gallia, Petr Kumpošt, Petr Šatra*	KZ	3	1P+2C	Z	z
14DATS	**Database Systems** *Jana Kaliková, Jan Krčál, Martin Šrotýř Jana Kaliková (Gar.)*	KZ	2	1P+1C	Z	z
15JZ1A	**Foreign Language - English 1** *Eva Rezlerová, Jan Feit, Klára Lancová, Lenka Monková, Marie Michlová, Jitka Heřmanová, Dana Boušová, Barbora Horáčková, Marek Tomeček, ... Jitka Heřmanová (Gar.)*	Z	3	0P+4C	Z	z

Characteristics of the courses of this group of Study Plan: Code=3.S.BP 18/19 Name=3.sem.bak.prez. od 18/19

11FYZ	Physics	Z,ZK	5
Kinematics, particle dynamics, dynamics of particle systems and rigid body. Continuum mechanics, thermodynamics.			
12MDE	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.			
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.			
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.			
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.			
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.			
14DATS	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.			
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.			

Code of the group: 4.S.BLED 16/17
Name of the group: 4.sem.LED bak.prez. (od) 16/17
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
11MSP	**Modeling of Systems and Processes** *Bohumil Kovář, Lucie Kárná, Jan Přikryl, Marek Honců, Elena Alexeeva **Bohumil Kovář** Bohumil Kovář (Gar.)*	Z,ZK	4	2P+2C+12B	L	z
21LTN	**Air Navigation** *Radoslav Zozuľák, Ladislav Keller*	Z,ZK	2	2P+1C+12B	L	z
21LTTE	**Aerodromes** *Roman Vokáč, Ladislav Capoušek, Petr Líkař **Ladislav Capoušek** Roman Vokáč (Gar.)*	Z,ZK	4	2P+1C+12B	L	z
21ZYL1	**Principles of Flight 1** *Roman Matyáš, Přemysl Vávra, Lukáš Matějka, Václav Brož, Stanislav Kušmírek, Stanislav Absolon, Michala Poštová, Tatiana Tsykina*	Z,ZK	5	2P+2C+16B	L	z
21LL1	**Aircraft 1** *Roman Matyáš, Vladimír Plos, Ladislav Keller, Anna Kačeriaková **Ladislav Keller***	KZ	3	2P+1C+10B	L	z
21MRG	**Meteorology** *Iveta Kameníková*	KZ	3	1P+1C+10B	L	z
21ULCT	**Aircraft Maintenance** *Roman Matyáš, Kateřina Kunčíková*	Z	2	2P+0C+8B	L	z
15JZ2A	**Foreign Language - English 2** *Eva Rezlerová, Jan Feit, Lenka Monková, Marie Michlová, Jitka Heřmanová, Dana Boušová, Barbora Horáčková, Marek Tomeček, Peter Morpuss, ...*	Z,ZK	3	0P+4C+10B	L	z

Characteristics of the courses of this group of Study Plan: Code=4.S.BLED 16/17 Name=4.sem.LED bak.prez. (od) 16/17

11MSP	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).			
21LTN	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.			
21LTTE	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.			
21ZYL1	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.			
21LL1	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.			
21MRG	Meteorology	KZ	3
Structure of atmosphere. Vertical stratification. Pressures QNH, QFE, QFF, QME. Instability. Atmospherical fronts. Atmospherical 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.			
21ULCT	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.			
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.			

Code of the group: 5.S.BLED 19/20
Name of the group: 5.sem.LED bak.prez. (od) 19/20
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
21LCM	**Aircraft Engines** *Roman Matyáš, Kateřina Kunčíková, František Straka, Daniel Hanus, Pavel Valenta Daniel Hanus (Gar.)*	Z,ZK	3	2P+1C	Z	z
21LGP	**Legislation and Operational Regulations** *Peter Vittek, Tomáš Pustina, Adéla Zmeškalová Peter Vittek (Gar.)*	Z,ZK	5	2P+2C	Z	z

21LTA2	**Aircraft 2** *Roman Matyáš, Ladislav Keller, Tomasz Balcerzak, Anna Kačeriaková Anna Kačeriaková (Gar.)*	Z,ZK	2	2P+1C	Z	z
21ZT	**ATM Systems** *Tereza Topková, Stanislav Pleninger*	ZK	2	2P+0C	Z	z
21ZYL2	**Principles of Flight 2** *Lenka Hanáková, Jakub Hospodka, Roman Matyáš, Přemysl Vávra, Lukáš Matějka, Václav Brož, Stanislav Absolon Václav Brož (Gar.)*	Z,ZK	5	2P+2C	Z	z
21LAG1	**English for Aviation 1** *Andrej Lališ, Slobodan Stojić, Sarah Van Den Bergh, Václav Brož Andrej Lališ (Gar.)*	KZ	3	0P+2C	Z	z
21PDLE	**Airport Design and Operation** *Petr Líkař*	KZ	3	1P+1C	Z	z

Characteristics of the courses of this group of Study Plan: Code=5.S.BLED 19/20 Name=5.sem.LED bak.prez. (od) 19/20

21LCM	Aircraft Engines	Z,ZK	3
Aircraft piston engine, theoretical background, operational characteristics and construction schemes. Propellers, operational characterictics. Turbine engine, theoretical background, thermal cycles, construction schemes, operational characteristics. Turbojet and turbofan engines, basic construction modules, and their operational characteristics. Engine control.			
21LGP	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.			
21LTA2	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.			
21ZT	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.			
21ZYL2	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, manoevures, stability and controllability, transsonic speeds.			
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.			
21PDLE	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: 6.S.BLED 19/20
Name of the group: 6.sem.LED bak.prez. 19/20
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
21ELED	**Air Transport Economy** *Peter Vittek, Radoslav Zozuľák*	Z,ZK	4	2P+2C+14B	L	z
21LIVO	**Human Performance and Limitations** *Lenka Hanáková, Vladimír Socha, Roman Matyáš, Ľubomír Háčik*	Z,ZK	5	2P+2C+14B	L	z
21OBP	**Airline Business and Operations** *Ladislav Capoušek, Tatiana Tsykina*	Z,ZK	3	2P+1C+12B	L	z
21PAP	**Flight Planning and Performance** *Ota Hajzler, Roman Matyáš*	Z,ZK	4	2P+2C+14B	L	z
21LAG2	**English in Aviation 2** *Andrej Lališ, Slobodan Stojić, Sarah Van Den Bergh Andrej Lališ (Gar.)*	KZ	3	0P+2C+10B	L	z
21PJE	**Aircraft Instruments** *Pavel Hovorka*	KZ	2	2P+0C+8B	L	z
21RILP	**Air Traffic Control** *Miloš Strouhal*	Z	2	0P+2C+8B	L	z

Characteristics of the courses of this group of Study Plan: Code=6.S.BLED 19/20 Name=6.sem.LED bak.prez. 19/20

21ELED	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 asignment. Aging of aircraft. Airlines bankrupcty. Crew planning. Marketing in Air Transport. Cargo tariff and rates. Air network configuration.			
21LIVO	Human Performance and Limitations	Z,ZK	5
Human performace & 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.			

21OBP	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.			
21PAP	Flight Planning and Performance	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.			
21LAG2	English in Aviation 2	KZ	3
Terminology in the sphere of aircraft construction, principles of flight, aircraft engines, instruments and systems.			
21PJE	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.			
21RILP	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: 6
The role of the block: PV

Code of the group: Y1-BLED 18/19
Name of the group: PVP bak.prez.LED 18/19
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 3 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)* *Tutors,* ***authors*** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
20Y1AF	**Alternative Forms of Transportation Project Financing** *Mária Jánešová*	KZ	2	2P+0C	Z	PV
18Y1AM	**Anatomy, Mobility and Safety of Man**	KZ	2	2P+0C	Z	PV
14Y1AV	**Animation and Visualization**	KZ	2	2P+0C	L	PV
20Y1AE	**Applied Electronics** *Tomáš Musil*	KZ	2	2P+0C	Z	PV
14Y1BE	**Barrierless Transport** ***Jan Krčál***	KZ	2	2P+0C	L	PV
21Y1BC	**Aviation safety and security** *Andrej Lališ, Slobodan Stojić, Roman Vokáč, Markéta Šedivá Kafková*	KZ	2	2P+0C	L	PV
15Y1BO	**Work Safety and Health Protection in Transportation** *Eva Rezlerová, Jan Feit, Petr Musil*	KZ	2	2P+0C	L	PV
21Y1BS	**Unmanned aircraft systems 1** *Šárka Hulínská, Adam Kleczatský, Ladislav Keller, Stanislav Kušmírek*	KZ	2	2P+0C	L	PV
14Y1BM	**Biometric Methods**	KZ	2	2+0	Z	PV
23Y1DZ	**Data and Their Processing for Engineering Fields Needs**	KZ	2	2+0	Z	PV
12Y1DS	**Project Documentation in Practice**	KZ	2	2+0	Z	PV
15Y1DZ	**History of Railway** *Martin Jacura, Eva Rezlerová, Jan Feit*	KZ	2	2P+0C	L	PV
20Y1EK	**Qualification in Electrical Engineering** *Jindřich Sadil*	KZ	2	2P+0C	L	PV
16Y1EN	**Energy Requirements of Vehicles** *Jaroslav Opava*	KZ	2	2P+0C	L	PV
20Y1EA	**Environmental Aspects of Transport**	KZ	2	2+0	Z	PV
15Y1EH	**European Integration within Historical Context** *Eva Rezlerová, Jan Feit*	KZ	2	2P+0C	Z	PV
18Y1EM	**Experimental Methods in Mechanics** *Daniel Kytýř, Stanislav Hračov*	KZ	2	2P+0C	Z	PV
21Y1FN	**Factors Affecting the Rate of Accidents in Aviation**	KZ	2	2+0	Z	PV
15Y1FD	**French Area Studies and Transportation** *Irena Veselková*	KZ	2	2P+0C	L	PV
14Y1HW	**Computer Hardware** ***Vít Fábera***	KZ	2	2P+0C	L	PV
15Y1HL	**History of Air Transport** *Eva Rezlerová, Jakub Kraus, Vladimír Plos, Jan Feit*	KZ	2	2P+0C	L	PV

15Y1HD	**History of City Mass Transport**	KZ	2	2+0	Z	PV
12Y1HD	**Traffic Noise** *Libor Ládyš*	KZ	2	2P+0C	L	PV
15Y1HE	**Work Hygiene and Ergonomics in Traffic** *Eva Rezlerová, Jan Feit, Petr Musil*	KZ	2	2P+0C	Z	PV
16Y1IS	**Interactive Systems and Simulations**	KZ	2	2P+0C	L	PV
12Y1KN	**Combined Transportation**	KZ	2	2+0	Z	PV
23Y1KO	**Quantum Physics and Optoelectronics**	KZ	2	2P+0C	L	PV
21Y1LA	**Aerobatics**	KZ	2	2+0	L	PV
21Y1LR	**Radio Technology in Aviation**	KZ	2	2+0	L	PV
17Y1LL	**Logistics of Passenger and Freight Air Transport** *Petra Skolilová*	KZ	2	2P+0C	L	PV
20Y1LN	**Location and Navigation** *Petr Bureš*	KZ	2	2P+0C	L	PV
21Y1MZ	**Managerial Ethics**	KZ	2	2+0	Z	PV
17Y1MD	**Marketing in Transportation** *Petra Skolilová*	KZ	2	2P+0C	Z	PV
11Y1MM	**Mathematical Models in Economy**	KZ	2	2P+0C	Z	PV
18Y1MT	**Engineering Materials** *Jaroslav Valach*	KZ	2	2P+0C	L	PV
21Y1MP	**Matlab for project-oriented study** *Lenka Hanáková, Vladimír Socha*	KZ	2	2P+0C	Z	PV
14Y1MP	**Modeling Complex Assemblies and Models in Parametric Modeller**	KZ	2	2+0	Z	PV
15Y1MK	**Modern History in Context: Every Day Life and Transport** *Eva Rezlerová, Jan Feit, Marie Michlová*	KZ	2	2P+0C	L	PV
15Y1NE	**German in the Economy and Society**	KZ	2	2+0	Z	PV
23Y1OK	**Protection of Critical Objects and Infrastructures**	KZ	2	2P+0C	L	PV
20Y1OI	**Fare Collection and Information Systems** *Milan Sliacky*	KZ	2	2P+0C	L	PV
14Y1OP	**Operating System**	KZ	2	2+0	Z	PV
17Y1OF	**Personal Finance**	KZ	2	2+0	Z	PV
11Y1PV	**Parametrical and Multicriterial Programming**	KZ	2	2+0	Z	PV
17Y1PM	**Personnel Management**	KZ	2	2P+0C	L	PV
14Y1PI	**Corporate Information System**	KZ	2	2+0	Z	PV
14Y1PZ	**Advanced Data Processing in Spreadsheets**	KZ	2	2P+0C	Z	PV
12Y1PD	**Assessment of Transport Structures** *Kristýna Neubergová*	KZ	2	2P+0C	Z	PV
14Y1PG	**Computer Graphics**	KZ	2	2P+0C	L	PV
14Y1P2	**Computer Aid of Transportation Projecting 2**	KZ	2	2P+0C	Z	PV
18Y1PS	**Computer Simulations in Mechanics** *Petr Zlámal*	KZ	2	2P+0C	L	PV
20Y1PK	**Product Quality Management Processes** *Martin Leso*	KZ	2	2P+0C	Z	PV
14Y1PJ	**C Programming Language**	KZ	2	2P+0C	Z	PV
12Y1C1	**Designing Roads in Civil 3D I** *Tomáš Honc*	KZ	2	2P+0C	L	PV
12Y1C2	**Designing Roads in Civil 3D II** *Tomáš Honc*	KZ	2	2P+0C	Z	PV
14Y1PA	**3D Modeling in AutoCAD**	KZ	2	2+0	Z	PV
16Y1PV	**Operation, Construction and Maintenance of Vehicles**	KZ	2	2P+0C	L	PV
12Y1PU	**Organization Disposition of Railway Stations** *Martin Jacura*	KZ	2	2P+0C	L	PV
12Y1PC	**Pedestrian and Cycling Transport**	KZ	2	2P+0C	L	PV
17Y1ST	**Titan Simulation**	KZ	2	2P+0C	L	PV
20Y1SC	**Sensors and Actuators** *Pavel Hrubeš*	KZ	2	2P+0C	L	PV
17Y1SL	**Sociology of Human Resources**	KZ	2	2+0	Z	PV
11Y1SI	**Transportation Software Engineering**	KZ	2	2+0	Z	PV
22Y1SZ	**Forensic Expertise**	KZ	2	2P+0C	L	PV
16Y1KS	**Quality and Reliability of Vehicles** *Jaroslav Machan*	KZ	2	2P+0C	Z	PV
12Y1SU	**Road Management and Maintenance** *Martin Höfler, Otakar Vacín*	KZ	2	2P+0C	L	PV

21Y1TH	**Aircraft Technical Handling** *Anna Polánecká*	KZ	2	2P+0C	Z	PV
11Y1TG	**Graph Theory**	KZ	2	2P+0C	L	PV
14Y1TI	**Creating Interactive Internet Applications**	KZ	2	2P+0C	L	PV
12Y1VC	**Waterways and Shipping**	KZ	2	2+0	Z	PV
23Y1VS	**Negotiation and Cooperation**	KZ	2	2+0	Z	PV
14Y1VM	**Development of Applications for Mobile Devices**	KZ	2	2+0	Z	PV
16Y1VT	**Development in Railroad Vehicles** *Jaroslav Opava*	KZ	2	2P+0C	L	PV
14Y1W1	**Webdesign 1**	KZ	2	2+0	Z	PV
14Y1W2	**Webdesign 2**	KZ	2	2P+0C	L	PV
16Y1ZL	**Vehicle Testing, Legislation and Construction** *Josef Mík*	KZ	2	2P+0C	Z	PV
16Y1ZG	**Introduction into Applied Computer Graphics** *Adam Orlický, Stanislav Novotný*	KZ	2	2P+0C	L	PV
14Y1ZM	**Fundamentals of Parametric and Adaptive Programming**	KZ	2	2P+0C	L	PV
11Y1ZM	**Foundation of MATLAB Programming**	KZ	2	2P+0C	L	PV
12Y1ZU	**Principles of Urbanism** *Karel Hájek*	KZ	2	2P+0C	Z	PV
15Y1ZV	**East-West dichotomy: Prelude to the Cold War** *Eva Rezlerová, Jan Feit, Marie Michlová*	KZ	2	2P+0C	Z	PV
21Y1UT	**Airports Maintenance**	KZ	2	2+0	L	PV
14Y1UP	**Editing of Theses in MS Word**	KZ	2	2P+0C	L	PV
18Y1UK	**Introduction of Rail Vehicles** *Josef Kolář*	KZ	2	2P+0C	L	PV
16Y1RE	**Control and Electronic Vehicle Systems** *Josef Mík, Jiří First*	KZ	2	2P+0C	Z	PV
21Y1RZ	**Human Resources Management** *Šárka Hulínská*	KZ	2	2P+0C	L	PV

Characteristics of the courses of this group of Study Plan: Code=Y1-BLED 18/19 Name=PVP bak.prez.LED 18/19

20Y1AF	Alternative Forms of Transportation Project Financing	KZ	2

In will be specifed such forms of financing in transportation and telecomunications, where the public sector body perform the final debtor, i. e. debt 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 and telecomunication projects.

18Y1AM	Anatomy, Mobility and Safety of Man	KZ	2

Survey of tissues. Anatomical structure and growth of bones. Articular joint. Remodelling of bone tissue. Anatomical structure of muscles. Blood circulation and nervous system. Structure and biomechanics of muscular-skeletal system. Injury of human organs and musculo-skeletal system during traffic accidents. Mobility of ill and injured man and his treatment. Human joint prostheses. Protective means and traffic safety regulations.

14Y1AV	Animation and Visualization	KZ	2

Introducing and basic 3D primitives and their basic modifications and transformations. Creating 3D scenes. Transformations of 3D primitives, connection / interaction / combination of 3D primitives, creating 3D bodies as non-primitives. Using of surfaces. Working with materials and material editors. Lightnings. Setting of light and material parameters. Scene capturing. Camera settings, moving in the scene. Rendering and making animation.

20Y1AE	Applied Electronics	KZ	2

Basic electronic semiconductor components, their principles, characteristics and typical connection diagrams. Semiconductor PN junction diodes, transistors, thyristor, operational amplifiers, basic logic gates. Functions of basic electronic circuits and methods for their designs (rectifiers, voltage regulator with Zener diode, transistor as an amplifier, operational amplifier as an inverting and noninverting amplifier).

14Y1BE	Barrierless Transport	KZ	2

The issue of barrierless accessible public transportation in terms of architectural barriers and also for transportation-technological point of view. Students will gain theoretical knowledge of barrierless environment roads, railway stations, public transport stops, terminal buildings, vehicles, public transport, information and orientation systems and transportation technology. Theoretical knowledge will be supplemented by practical examples.

21Y1BC	Aviation safety and security	KZ	2

History of safety and security development in aviation. Modern tools for safety and security management. Research and development of safe and secure systems.

15Y1BO	Work Safety and Health Protection in Transportation	KZ	2

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.

21Y1BS	Unmanned aircraft systems 1	KZ	2

Unmanned Aviation Development. Aircraft design. Legislation in force in the Czech Republic. Planning and execution of the flight. Airspace division. Operational risks and operational procedures. Practical flights.

14Y1BM	Biometric Methods	KZ	2

Basic biometric terms, authentication methods, principles and performance measurement of biometric systems, overview of biometric technologies, hand geometry, iris recognition, retina recognition method, 2D and 3D face recognition, vein patterns on the wrist, ear biometrics, fingerprint recognition, skin spectroscopy, behavioral methods, the use of biometrics in transport applications, safety and risks of biometric technologies.

23Y1DZ	Data and Their Processing for Engineering Fields Needs	KZ	2

Courses of risk, basic terms, data collection, data sets, data random uncertainty and data epistemic uncertainty, data processing, hazard, risk, value scales, analytical, empirical and heuristic methods, hazard determination and risk determination, methods for variants´ creation, decision support systems.

12Y1DS	Project Documentation in Practice	KZ	2

Project documentation creating. Project documentation types. Support materials for project documentation creating. Building permit obtaining process. Budget and pricing. Practical creation of some project documentation parts.

15Y1DZ	History of Railway	KZ	2
Horse-drawn railways, steam railways, railway network development in the 2nd half of 19th century, regional railways epoch, railways of the "First Republic", electric traction, World War II railways, railway development in the 2nd half of 20th century, high-speed railway origins, railway lines closing, important long-distance train connections, railway lines construction, railway accidents, railway junctions. Excursions and projections.			
20Y1EK	Qualification in Electrical Engineering	KZ	2
Practical experience with measurements in laboratories, electrical equipment, power supply, electrical installation of low voltage, electric shock hazard, symbols and labeling, nominal voltage, maximum allowed currents, electrical equipment protection against short circuit and overload protection, control and revision, first aid, legislation, standards and regulations in relation to health and safety and electrical engineering.			
16Y1EN	Energy Requirements of Vehicles	KZ	2
Dynamics and the driving inertial of the vehicles. Types of energy - kinetic, static, heat, chemical and others. Ways of energy change into kinetic energy. Combustion engine, electric drive, steam engine, air engine. Energy accumulation means, accumulator, flywheel, fuel cell. Energy recuperation. WTW analysis.			
20Y1EA	Environmental Aspects of Transport	KZ	2
State of the atmosphere, weather observation network, weather in transportation, road meteorology. Weather forecasting, data assimilation, probabilistic forecasts, forecast evaluation. Air quality, main pollutants and their effects, atmospheric chemistry, traffic emissions. Greenhouse gasses, carbon cycle, a role of energy and transportation in climate change.			
15Y1EH	European Integration within Historical Context	KZ	2
Versailles system, formation of new states. Europe and the powers, League of Nations. European policy in the 1920s. Fascism, nacism, communism. Little Entente, its principles and goals. Europe after Hitler's getting to power, system of bilateral agreements. Decline of the LN. Rearrangement of powers during WWII. Cold war and its consequences for Europe. New quality of French-German relationship - a driving power of starting European integration.			
18Y1EM	Experimental Methods in Mechanics	KZ	2
The purpose and role of experimental mechanics. Sensors for mechanical testing. Overview of experimental methods. Destructive and non-destructive testing of materials. Design of experimental procedures and sample preparation. Tensile and bending tests. Electrical resistance strain gages. Optical based strain measurement. Fatigue and lifetime prediction. Instrumented hardness testing. Introduction to electron microscopy. Errors in measurement.			
21Y1FN	Factors Affecting the Rate of Accidents in Aviation	KZ	2
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.			
15Y1FD	French Area Studies and Transportation	KZ	2
France - geography and regions, transport infrastructure. Paris and its sights, city public transport. Road traffic, motorways, railway traffic, TGV, air traffic, specialised terminology. French society and culture. Current political system. System of education, studying in France. Selected authors of French literature. French gastronomy.			
14Y1HW	Computer Hardware	KZ	2
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).			
15Y1HL	History of Air Transport	KZ	2
Aeronautics. Beginnings of aircrafts heavier than air. Czechoslovak aviation pioneers. Development of airports in the Czech Republic. World airports. Airlines of the world. Helicopters. CSA airplanes. Famous aviators. Classic era of aviation. Golden era of civil aviation. Supersonic flying. Modern era of civil aviation. Flying in the world.			
15Y1HD	History of City Mass Transport	KZ	2
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.			
12Y1HD	Traffic Noise	KZ	2
Acoustic introduction, basic terms, quantities. Basics of physiological acoustic, noise impacts on human body. Acoustic legislation, standarts, regulations. Creation acoustic climate in area, principles of urban acoustic, noise transmission, soundproofing. Types of noise sources in area. Determination of acoustic situation in the area of interest. Methodology of computing and measurement of transport noise. Acoustic studies, measuring protocol.			
15Y1HE	Work Hygiene and Ergonomics in Traffic	KZ	2
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 a man. Practical examples from the field of transportation; relevant legislature.			
16Y1IS	Interactive Systems and Simulations	KZ	2
Principles of vehicle movement. Forces in moving vehicle, origin, classification, assesment. Adhesion. Traction output. Drives, source systems, classification, structure, operational and energetic singularity. Sources of energy. Calculations to assess output quantities and energetic intensity. Auxiliary systems energy consumption.			
12Y1KN	Combined Transportation	KZ	2
Combined transport strategy and legislation. Load units. Means of transport in combined transport. Combined transport systems. Transshipping areas. Multimodal logistic centres.			
23Y1KO	Quantum Physics and Optoelectronics	KZ	2
Ground of quantum physics. Application of quantum physics in practice. Optoelectronics. Production of optoelectronics components.			
21Y1LA	Aerobatics	KZ	2
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.			
21Y1LR	Radio Technology in Aviation	KZ	2
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.			
17Y1LL	Logistics of Passenger and Freight Air Transport	KZ	2
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.			
20Y1LN	Location and Navigation	KZ	2
Description and examples of road networks, localization on the network. Routing algorithms, their properties and implementation. Description and examples of datasets for finding transport connections, routing algorithms, their properties and implementation.			
21Y1MZ	Managerial Ethics	KZ	2
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.			
17Y1MD	Marketing in Transportation	KZ	2
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.			

11Y1MM	Mathematical Models in Economy	KZ	2
The goal of the course is to teach selected methods of linear programming, with theoretical procedures applicable for individual tasks and their program implementation. The outcom of the course is the ability to implement and solve basic tasks from the queue theory, graph theory and both free and constrained optimization.			
18Y1MT	Engineering Materials	KZ	2
Systematic overview of main classes of materials used in technical design. In addition to main classes of materials, i. e. metals, ceramics, polymers and composites, attention is paid to biological materials and to biomimetics. Integral approach to material selection process is also demonstrated based on so called Ashby's selection charts.			
21Y1MP	Matlab for project-oriented study	KZ	2
The subject's syllabus is focused on the problem-solving during bachelor's thesis preparation and it is based on students' requests. Individual exercises will be prepared according to particular examples, based on actual students' needs and suggestions. The subject will have a flexible form, which is expected to bring an improvement of students' Matlab skills.			
14Y1MP	Modeling Complex Assemblies and Models in Parametric Modeller	KZ	2
Assemblies programming - tools and methodology of working subassemblies and assemblies, sheet metal parts modelling, welded assemblies, pipelines, and distribution lines. Photorealistic output rendering - physical and material properties, lighting sources. MKP - visual example.			
15Y1MK	Modern History in Context: Every Day Life and Transport	KZ	2
Historical overview of modern history of every day life, science, technology and transport in a wider context.			
15Y1NE	German in the Economy and Society	KZ	2
Recent economic and social issues of German speaking countries and of the EU. Reading and listening of texts. Lexical, grammatical and semantic analysis of texts. Discussion on selected topics.			
23Y1OK	Protection of Critical Objects and Infrastructures	KZ	2
Types of technological systems, critical item, risks and their courses, criticality, vulnerability, connectivity, dependability, resilience, failure, protection, safety of critical objects and critical infrastructures.			
20Y1OI	Fare Collection and Information Systems	KZ	2
Fare collection systems in public transport and their components (on-board units, validators, turnstiles, ...). Information systems and their components for users (timetables, maps, panels ...) and operators (cycles, location or current delay of vehicles, ...). The issue of tariff systems. Other examples of clearance systems (parking).			
14Y1OP	Operating System	KZ	2
Distributions. Installation GNU/Linux OS. X-window system. Rights management - users and groups, ACL rights. Filesystems and attributes. Programs and processess. OS boot, runlevels. Basic console programs / commands. Config files. SW management, package systems. Programs in graphic shell - text, spreadsheet, graphic editors, sound, video and communication. Services management. Safe and secure configuration of OS. Remote administration.			
17Y1OF	Personal Finance	KZ	2
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).			
11Y1PV	Parametrical and Multicriterial Programming	KZ	2
Solution to the problem of linear programming with a parameter in objective function, on right sides and in the matrix of coeficients of linear constraints. Computation of efficient solution.			
17Y1PM	Personnel Management	KZ	2
Human sources, work group, man as personality, planning, choice, evaluation and education of human sources, work adaptation, teamwork, intercultural communication.			
14Y1PI	Corporate Information System	KZ	2
Data-information-knowledge, components of information system, syntatic and semantic sense of data, structure of corporate information system, particular information system (personalistic, production, storage, etc.), corporate information politic and information control, risks of information system operation, legal environment of information system operation, state information system, information system security, data protection, safety politics.			
14Y1PZ	Advanced Data Processing in Spreadsheets	KZ	2
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.			
12Y1PD	Assessment of Transport Structures	KZ	2
Assessment of transport structures, the EIA process. Multicriteria assessment methods, risk analysis, SWOT analysis. Landscape character, possibilities of its protection and assessment transport structures on the landscape. Rating fragmentation and landscape connectivity in the preparation of linear structures. Practical examples of assessment of traffic buildings on the environment.			
14Y1PG	Computer Graphics	KZ	2
Basic formats of graphic and possibilities of their editing and mutual conversion. Use of individual types according to character of work. Work with editing programs (within the user level scope) using layers, DPI, colors. Basics of digital photography, scanning and computer technology like monitors and graphics cards.			
14Y1P2	Computer Aid of Transportation Projecting 2	KZ	2
Overview of CAx application for transportation projecting aid. AutoCAD environment possibilities of basic tasks automatizing (programming, scripting, data exchange). Advanced blocks modification (attributes, relation to databases). Work in projecting group, external references. Basic tasks for cummunication projecting (clotoidic transition curve, cross-and longitudinal section). Basics of 3D modelling.			
18Y1PS	Computer Simulations in Mechanics	KZ	2
Principles and overview of programs for stress analysis of structures. Numerical methods in mechanics, finite element method. Geometric model development and adaptation of geometry from other CAE systems. Assignment of material properties. The types of elements and their use. Discretization of solid model. Boundary conditions and application of the load. Basic tasks of structural and modal analysis. Introduction to complex nonlinear problems.			
20Y1PK	Product Quality Management Processes	KZ	2
General principles of organization management. Management systems and international standards; quality management systems. Quality products, processes, systems. A framework of standards for systems management, management principles. Principles of process management, monitoring and measurement systems management. Uniform framework of standards for systems management. Process management principles. Metrology and testing. Product certification.			
14Y1PJ	C Programming Language	KZ	2
C programming language. Preprocessor, basics of the C language (data types, syntax, commands), functions, pointes, dynamical memory allocation, string, files, structures and unions. Implementations of abstract data types (FIFO, LIFO, list), programming techniques (sorting, searching, recursion), using bitwise oprerators.			
12Y1C1	Designing Roads in Civil 3D I	KZ	2
The course is devoted to the traffic buildings design field, specifically the design of roads as such, by the means of a 3D software. Students go through the complete design of this particular linear building, from the initial situation, over the longitudinal section, to the model and work sections and the cubic capacity calculation. The course also includes a basic explanation of the traffic building design in the real-life profession.			

12Y1C2	Designing Roads in Civil 3D II	KZ	2
The course is devoted to the traffic buildings design field, specifically the design of roads as such, by the means of a 3D software. Students go through the complete design of this particular linear building, from the initial situation, over the longitudinal section, to the model and work sections and the cubic capacity calculation. The previously acquired skills are improved and developed. Students learn to design intersections.			
14Y1PA	3D Modeling in AutoCAD	KZ	2
Work in 3D non-parametric modeller (AutoCAD) environment, scenes rendering, creation of planar and volumetric objects, user setup creation, object data creation, work with data connected with external database. Basic definition of work with lights, materials and reflexes. Models presentation.			
16Y1PV	Operation, Construction and Maintenance of Vehicles	KZ	2
Methods of vehicle production. Vehicle maintenance. Vehicle diagnostics. Maintenence and repair plans. Engine maintenance and emission measurement. Transmission mechanism. General principles of engine diagnostics.			
12Y1PU	Organization Disposition of Railway Stations	KZ	2
Connecting station. Passenger transport equipment. Freight transport equipment. Branch lines and railway traffic inside industrial company areas. Zone stations. Formation yards. Reserve stations. Technology of work in railway station with regard to its disposition. Railway station documentations in the Czech Republic railway network.			
12Y1PC	Pedestrian and Cycling Transport	KZ	2
Routes for pedestrians. Pedestrian crossings. Modifications for blind, dim-sighted and disabled people. Design of cycle routes network. Ways of cycle route layout and design parameters for cyclists. Separation of cyclists from other transport modes. Cycle tracks and its design - one way streets, reserved traffic lanes, bus stops, crossings with other transport modes, crossroads. Traffic signs and road marking for cyclists.			
17Y1ST	Titan Simulation	KZ	2
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.			
20Y1SC	Sensors and Actuators	KZ	2
Principles of sensors and actuators. Basics of measuring theory and actuating influence. The respective technologies and construction principles. Sensors of mechanical, electro-magnetic, state (temperature, humidity), chemical and particle flow values. Electrical, pneumatic and hydraulic actuators and solid phase elements.			
17Y1SL	Sociology of Human Resources	KZ	2
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.			
11Y1SI	Transportation Software Engineering	KZ	2
Basic concepts of software engineering, ranging from domain analysis, requirement analysis and software architectures to analyses, design and implementation using formal techniques and practical usuage.			
22Y1SZ	Forensic Expertise	KZ	2
Historical evolution of forensic engineering, forensic activity, current legislature in the Czech Republic, different disciplines, notion of forensic, forensic legislation, basic forensic acts, expert role in the obtaining proofs, forensic methodology. Notion of the evidence, general principles of evidence obtaining, metrology, protocol, evidences collection, site inspection, forensic report, elements. Finding, expert testimony / report.			
16Y1KS	Quality and Reliability of Vehicles	KZ	2
Quality and reliability theory in design, development, production and operation of vehicles. Definition and possible approach to quality and reliability. Key legislation. FMEA (Failure Mode and Effects Analysis), QFD (Quality Function Deployment), DFx (Design for Assamly, Manufacturying, Quality, Services ...) and other methods used in industrial applications. Knowledge-based systems of quality and reliability, data collection.			
12Y1SU	Road Management and Maintenance	KZ	2
Getting familiar with ownership of roads in the Czech Republic and the administration of the road at the state and county level. It is presented development of road network, short, medium and long-term strategy of the Ministry of Transport. Maintenance of roads winter and summer, its requirements, specifics, possibilities and repair methods are discussed in the classroom as well as investment activity in highway engineering.			
21Y1TH	Aircraft Technical Handling	KZ	2
Aircraft towing and pushing tractors. GPU. Air conditioning and heating units. Aircraft fuel equipment. De-acing and anti-icing units. Loading and unloading units. Equipment for passangers onboarding and offboarding. Operational processes of aircraft technical handling and regulations. Modernization and technical progress.			
11Y1TG	Graph Theory	KZ	2
Directed and undirected graphs, weighted graphs, matrices descripting graphs, minimal spanning tree, minimal path, Eulerian paths, graph traversing, matching in bipartite graphs, flow networks. Algorithms for problems of existence and optimization. Solving of NP-hard problems, heuristic approach.			
14Y1TI	Creating Interactive Internet Applications	KZ	2
Possibilities of scripting language PHP. Overview of PHP language syntax, and functions. Analysis of finished scripts and demonstration of solutions. Your own application programmed in PHP language.			
12Y1VC	Waterways and Shipping	KZ	2
Basic modes of transport. The position of water transport in the transport system of the Czech Republic and the EU. Advantages and disadvantages of water transport. Basic systems of waterways in Europe, a network of waterways in the Czech Republic. Construction of the waterway and its equipment. Management of waterways and its operation. The legal regime in inland navigation, navigation rules of operation, navigation maps.			
23Y1VS	Negotiation and Cooperation	KZ	2
Code of conduct for negotiation. The influence of personality traits on the negotiations. Negotiation and commanding. Teamwork. Variants teams. Informal and formal role in the team. Principles of negotiation, the essence of negotiation, the differences in negotiation in business and in crisis situations, the principle of "win both", specifications and bidding, the role of trust.			
14Y1VM	Development of Applications for Mobile Devices	KZ	2
Object oriented programming, Java programming language, development environment, operating system Android, development application - widgets, containers, threads, menu, permissions, services, GUI.			
16Y1VT	Development in Railroad Vehicles	KZ	2
Railroad vehicles traction. Railroad vehicle parametres regulation. Control and driving of railroad vehicles. Importance in heavy duty and personal transportation. Critical situation assesment. New materials in design. International standardization.			
14Y1W1	Webdesign 1	KZ	2
Students will learn the basics of communication HTTP, URL and addressing, markup languages HTML and XHTML, HTML tags, rules of web accessibility and usability, CSS properties and selectors, the issue of web browsers, creating one to three column layout pages, sites validation, conditional comments. Topics will be practiced on practical examples.			
14Y1W2	Webdesign 2	KZ	2
Students will learn advanced techniques CSS, responsive webdesign, CSS frontends, content management systems, JavaScript, jQuery, SEO, web server installation + configuration directives. Topics will be practiced on practical examples.			

16Y1ZL	Vehicle Testing, Legislation and Construction	KZ	2
Vehicle, bus and motorbike costruction, aggregate computing, driving resistance, build and parameters of traction, constructional arrangement of personal cars, trucks, buses, motorbikes, legislation in the EU and in the world, technical legislation creation, testing methods, vehicle tests, accelerated tests, mathematical modelling in testing.			
16Y1ZG	Introduction into Applied Computer Graphics	KZ	2
Computer graphics, division and applications with emphasis on transport, including development and research. Colours, colour perception, colour schemes, models, principles of 2D and 3D generation, elementary algorithms for graphic data workout. Visualisation principles and tasks, technics, graphics and visualisation HW basics. Introduction to 2D and 3D graphics software.			
14Y1ZM	Fundamentals of Parametric and Adaptive Programming	KZ	2
Basics of work at products and parts creation. Sketch drawing by help of geometric relations, parametric dimensions, creation of adaptive models from 2D sketches. Import and export from and to another systems. Fundamentals of assemblies creation.			
11Y1ZM	Foundation of MATLAB Programming	KZ	2
To explain the principle of algorithmization, flow charts, description of MATLAB environment and its settings, MATLAB help, mathematical operators, matrices and elements operations, control flow, inputs and outputs, graphics, optimization and program code debugging.			
12Y1ZU	Principles of Urbanism	KZ	2
Survey on history of city and settlement building. Functional components and their mutual relations (working, living, recreation, transportation). Spacial arrangement of settlements. Types of towns or cities with a certain prevailing function, forms of their development. Brief overview of land-use planning.			
15Y1ZV	East-West dichotomy: Prelude to the Cold War	KZ	2
Historical prologue, evolution of the "West" and "East" from the 1500s. Focus on the history in the period between 1850 nad 1950. Milestones and continuity of the international relations in the end of 19th century and the beginning of the 20th century. Revolutions, the causes and consequences. Scientific and technological progress, the causes and consequences. Economic and financial history. Social changes. Discussions on texts, sources.			
21Y1UT	Airports Maintenance	KZ	2
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.			
14Y1UP	Editing of Theses in MS Word	KZ	2
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.			
18Y1UK	Introduction of Rail Vehicles	KZ	2
Basic characteristics and parameters rail transport systems - railway and urban transport. Basis driving mechanics rail vehicles - equation of motion train and unit trains. Rolling and track resistance. Total running resistance. Acceleration force. Analyzing driving cycle rail vehicle. Speed-power diagrams and characteristics rail vehicle - hydromechanic, hydrodynamic and electric drive. Design concept rail vehicles and drive of wheel set.			
16Y1RE	Control and Electronic Vehicle Systems	KZ	2
Elementary concepts of regulation. Tools for analytical solution, linear system description. Basic types of a regulator (PID), properties, advantages, disadvantages, function. Conventional and hybrid drive control. Electric drive. Vehicle communication bus (CAN, LIN, FlexRay, ISObus, KWP2000 protocole etc.). Vehicle electronic control, safety, communication and comfort systems.			
21Y1RZ	Human Resources Management	KZ	2
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.			

Name of the block: Jazyky
Minimal number of credits of the block: 6
The role of the block: J

Code of the group: JZ-B-3,4 16/17
Name of the group: Jazyk bak. 5., 6.sem. od 16/17
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)*** *Tutors,* ***authors*** *and guarantors (gar.)*	Completion	Credits	Scope	Semester	Role
15JZ3F	**Foreign Language - French 3** *Eva Rezlerová, Jan Feit, Irena Veselková*	Z	3	0P+4C	Z	J
15JZ3I	**Foreign Language - Italian 3**	Z	3	0P+4C	Z	J
15JZ3N	**Foreign Language - German 3** *Eva Rezlerová, Jan Feit, Jana Štikarová, Alexej Kusák, Petra Mračková Vavroušová Eva Rezlerová (Gar.)*	Z	3	0P+4C	Z	J
15JZ3R	**Foreign Language - Russian 3** *Eva Rezlerová, Jan Feit, Marie Michlová*	Z	3	0P+4C	Z	J
15JZ3S	**Foreign Language - Spanish 3** *Eva Rezlerová, Jan Feit, Petra Mračková Vavroušová, Nina Hricsina Puškinová Petra Mračková Vavroušová (Gar.)*	Z	3	0P+4C	Z	J
15JZ4F	**Foreign Language - French 4** *Eva Rezlerová, Jan Feit, Irena Veselková*	Z,ZK	3	0P+4C+10B	L	J
15JZ4I	**Foreign Language - Italian 4**	Z,ZK	3	0P+4C+10B	L	J

15JZ4N	**Foreign Language - German 4** *Eva Rezlerová, Jan Feit, Jana Štikarová*	Z,ZK	3	0P+4C+10B	L	J
15JZ4R	**Foreign Language - Russian 4** *Eva Rezlerová, Jan Feit, Marie Michlová*	Z,ZK	3	0P+4C+10B	L	J
15JZ4S	**Foreign Language - Spanish 4** *Eva Rezlerová, Jan Feit, Nina Hricsina Puškinová Nina Hricsina Puškinová (Gar.)*	Z,ZK	3	0P+4C+10B	L	J

Characteristics of the courses of this group of Study Plan: Code=JZ-B-3,4 16/17 Name=Jazyk bak. 5., 6.sem. od 16/17

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.			

List of courses of this pass:

Code	Name of the course	Completion	Credits
11CAL1	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	Calculus 2	Z,ZK	5
Antiderivative, 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.			
11FYZ	Physics	Z,ZK	5
Kinematics, particle dynamics, dynamics of particle systems and rigid body. Continuum mechanics, thermodynamics.			
11GIE	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.			

11LA	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	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	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.			
11X31	Project 1	Z	2
11X32	Project 2	Z	2
11X33	Project 3	Z	2
11Y1MM	Mathematical Models in Economy	KZ	2
The goal of the course is to teach selected methods of linear programming, with theoretical procedures applicable for individual tasks and their program implementation. The outcom of the course is the ability to implement and solve basic tasks from the queue theory, graph theory and both free and constrained optimization.			
11Y1PV	Parametrical and Multicriterial Programming	KZ	2
Solution to the problem of linear programming with a parameter in objective function, on right sides and in the matrix of coeficients of linear constraints. Computation of efficient solution.			
11Y1SI	Transportation Software Engineering	KZ	2
Basic concepts of software engineering, ranging from domain analysis, requirement analysis and software architectures to analyses, design and implementation using formal techniques and practical usuage.			
11Y1TG	Graph Theory	KZ	2
Directed and undirected graphs, weighted graphs, matrices descripting graphs, minimal spanning tree, minimal path, Eulerian paths, graph traversing, matching in bipartite graphs, flow networks. Algorithms for problems of existence and optimization. Solving of NP-hard problems, heuristic approach.			
11Y1ZM	Foundation of MATLAB Programming	KZ	2
To explain the principle of algorithmization, flow charts, description of MATLAB environment and its settings, MATLAB help, mathematical operators, matrices and elements operations, control flow, inputs and outputs, graphics, optimization and program code debugging.			
12MDE	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.			
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.			
12X31	Project 1	Z	2
12X32	Project 2	Z	2
12X33	Project 3	Z	2
12Y1C1	Designing Roads in Civil 3D I	KZ	2
The course is devoted to the traffic buildings design field, specifically the design of roads as such, by the means of a 3D software. Students go through the complete design of this particular linear building, from the initial situation, over the longitudinal section, to the model and work sections and the cubic capacity calculation. The course also includes a basic explanation of the traffic building design in the real-life profession.			
12Y1C2	Designing Roads in Civil 3D II	KZ	2
The course is devoted to the traffic buildings design field, specifically the design of roads as such, by the means of a 3D software. Students go through the complete design of this particular linear building, from the initial situation, over the longitudinal section, to the model and work sections and the cubic capacity calculation. The previously acquired skills are improved and developed. Students learn to design intersections.			
12Y1DS	Project Documentation in Practice	KZ	2
Project documentation creating. Project documentation types. Support materials for project documentation creating. Building permit obtaining process. Budget and pricing. Practical creation of some project documentation parts.			
12Y1HD	Traffic Noise	KZ	2
Acoustic introduction, basic terms, quantities. Basics of physiological acoustic, noise impacts on human body. Acoustic legislation, standarts, regulations. Creation acoustic climate in area, principles of urban acoustic, noise transmission, soundproofing. Types of noise sources in area. Determination of acoustic situation in the area of interest. Methodology of computing and measurement of transport noise. Acoustic studies, measuring protocol.			
12Y1KN	Combined Transportation	KZ	2
Combined transport strategy and legislation. Load units. Means of transport in combined transport. Combined transport systems. Transshipping areas. Multimodal logistic centres.			
12Y1PC	Pedestrian and Cycling Transport	KZ	2
Routes for pedestrians. Pedestrian crossings. Modifications for blind, dim-sighted and disabled people. Design of cycle routes network. Ways of cycle route layout and design parameters for cyclists. Separation of cyclists from other transport modes. Cycle tracks and its design - one way streets, reserved traffic lanes, bus stops, crossings with other transport modes, crossroads. Traffic signs and road marking for cyclists.			
12Y1PD	Assessment of Transport Structures	KZ	2
Assessment of transport structures, the EIA process. Multicriteria assessment methods, risk analysis, SWOT analysis. Landscape character, possibilities of its protection and assessment transport structures on the landscape. Rating fragmentation and landscape connectivity in the preparation of linear structures. Practical examples of assessment of traffic buildings on the environment.			
12Y1PU	Organization Disposition of Railway Stations	KZ	2
Connecting station. Passenger transport equipment. Freight transport equipment. Branch lines and railway traffic inside industrial company areas. Zone stations. Formation yards. Reserve stations. Technology of work in railway station with regard to its disposition. Railway station documentations in the Czech Republic railway network.			

12Y1SU	Road Management and Maintenance	KZ	2
Getting familiar with ownership of roads in the Czech Republic and the administration of the road at the state and county level. It is presented development of road network, short, medium and long-term strategy of the Ministry of Transport. Maintenance of roads winter and summer, its requirements, specifics, possibilities and repair methods are discussed in the classroom as well as investment activity in highway engineering.			
12Y1VC	Waterways and Shipping	KZ	2
Basic modes of transport. The position of water transport in the transport system of the Czech Republic and the EU. Advantages and disadvantages of water transport. Basic systems of waterways in Europe, a network of waterways in the Czech Republic. Construction of the waterway and its equipment. Management of waterways and its operation. The legal regime in inland navigation, navigation rules of operation, navigation maps.			
12Y1ZU	Principles of Urbanism	KZ	2
Survey on history of city and settlement building. Functional components and their mutual relations (working, living, recreation, transportation). Spacial arrangement of settlements. Types of towns or cities with a certain prevailing function, forms of their development. Brief overview of land-use planning.			
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.			
14DATS	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.			
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 possibilites, AutoCAD environment profiles, drawings with raster foundaments).			
14PRG	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.			
14X31	Project 1	Z	2
14X32	Project 2	Z	2
14X33	Project 3	Z	2
14Y1AV	Animation and Visualization	KZ	2
Introducing and basic 3D primitives and their basic modifications and transformations. Creating 3D scenes. Transformations of 3D primitives, connection / interaction / combination of 3D primitives, creating 3D bodies as non-primitives. Using of surfaces. Working with materials and material editors. Lightnings. Setting of light and material parameters. Scene capturing. Camera settings, moving in the scene. Rendering and making animation.			
14Y1BE	Barrierless Transport	KZ	2
The issue of barrierless accessible public transportation in terms of architectural barriers and also for transportation-technological point of view. Students will gain theoretical knowledge of barrierless environment roads, railway stations, public transport stops, terminal buildings, vehicles, public transport, information and orientation systems and transportation technology. Theoretical knowledge will be supplemented by practical examples.			
14Y1BM	Biometric Methods	KZ	2
Basic biometric terms, authentication methods, principles and performance measurement of biometric systems, overview of biometric technologies, hand geometry, iris recognition, retina recognition method, 2D and 3D face recognition, vein patterns on the wrist, ear biometrics, fingerprint recognition, skin spectroscopy, behavioral methods, the use of biometrics in transport applications, safety and risks of biometric technologies.			
14Y1HW	Computer Hardware	KZ	2
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).			
14Y1MP	Modeling Complex Assemblies and Models in Parametric Modeller	KZ	2
Assemblies programming - tools and methodology of working subassemblies and assemblies, sheet metal parts modelling, welded assemblies, pipelines, and distribution lines. Photorealistic output rendering - physical and material properties, lighting sources. MKP - visual example.			
14Y1OP	Operating System	KZ	2
Distributions. Installation GNU/Linux OS. X-window system. Rights management - users and groups, ACL rights. Filesystems and attributes. Programs and processess. OS boot, runlevels. Basic console programs / commands. Config files. SW management, package systems. Programs in graphic shell - text, spreadsheet, graphic editors, sound, video and communication. Services management. Safe and secure configuration of OS. Remote administration.			
14Y1P2	Computer Aid of Transportation Projecting 2	KZ	2
Overview of CAx application for transportation projecting aid. AutoCAD environment possibilities of basic tasks automatizing (programming, scripting, data exchange). Advanced blocks modification (attributes, relation to databases). Work in projecting group, external references. Basic tasks for cummunication projecting (clotoidic transition curve, cross-and longitudinal section). Basics of 3D modelling.			
14Y1PA	3D Modeling in AutoCAD	KZ	2
Work in 3D non-parametric modeller (AutoCAD) environment, scenes rendering, creation of planar and volumetric objects, user setup creation, object data creation, work with data connected with external database. Basic definition of work with lights, materials and reflexes. Models presentation.			
14Y1PG	Computer Graphics	KZ	2
Basic formats of graphic and possibilities of their editing and mutual conversion. Use of individual types according to character of work. Work with editing programs (within the user level scope) using layers, DPI, colors. Basics of digital photography, scanning and computer technology like monitors and graphics cards.			
14Y1PI	Corporate Information System	KZ	2
Data-information-knowledge, components of information system, syntatic and semantic sense of data, structure of corporate information system, particular information system (personalistic, production, storage, etc.), corporate information politic and information control, risks of information system operation, legal environment of information system operation, state information system, information system security, data protection, safety politics.			

14Y1PJ	C Programming Language	KZ	2
C programming language. Preprocessor, basics of the C language (data types, syntax, commands), functions, pointes, dynamical memory allocation, string, files, structures and unions. Implementations of abstract data types (FIFO, LIFO, list), programming techniques (sorting, searching, recursion), using bitwise oprerators.			
14Y1PZ	Advanced Data Processing in Spreadsheets	KZ	2
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.			
14Y1TI	Creating Interactive Internet Applications	KZ	2
Possibilities of scripting language PHP. Overview of PHP language syntax, and functions. Analysis of finished scripts and demonstration of solutions. Your own application programmed in PHP language.			
14Y1UP	Editing of Theses in MS Word	KZ	2
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.			
14Y1VM	Development of Applications for Mobile Devices	KZ	2
Object oriented programming, Java programming language, development environment, operating system Android, development application - widgets, containers, threads, menu, permissions, services, GUI.			
14Y1W1	Webdesign 1	KZ	2
Students will learn the basics of communication HTTP, URL and addressing, markup languages HTML and XHTML, HTML tags, rules of web accessibility and usability, CSS properties and selectors, the issue of web browsers, creating one to three column layout pages, sites validation, conditional comments. Topics will be practiced on practical examples.			
14Y1W2	Webdesign 2	KZ	2
Students will learn advanced techniques CSS, responsive webdesign, CSS frontends, content management systems, JavaScript, jQuery, SEO, web server installation + configuration directives. Topics will be practiced on practical examples.			
14Y1ZM	Fundamentals of Parametric and Adaptive Programming	KZ	2
Basics of work at products and parts creation. Sketch drawing by help of geometric relations, parametric dimensions, creation of adaptive models from 2D sketches. Import and export from and to another systems. Fundamentals of assemblies creation.			
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.			
15X31	Project 1	Z	2
15X32	Project 2	Z	2
15X33	Project 3	Z	2
15Y1BO	Work Safety and Health Protection in Transportation	KZ	2
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.			
15Y1DZ	History of Railway	KZ	2
Horse-drawn railways, steam railways, railway network development in the 2nd half of 19th century, regional railways epoch, railways of the "First Republic", electric traction, World War II railways, railway development in the 2nd half of 20th century, high-speed railway origins, railway lines closing, important long-distance train connections, railway lines construction, railway accidents, railway junctions. Excursions and projections.			
15Y1EH	European Integration within Historical Context	KZ	2
Versailles system, formation of new states. Europe and the powers, League of Nations. European policy in the 1920s. Fascism, nacism, communism. Little Entente, its principles and goals. Europe after Hitler's getting to power, system of bilateral agreements. Decline of the LN. Rearrangement of powers during WWII. Cold war and its consequences for Europe. New quality of French-German relationship - a driving power of starting European integration.			
15Y1FD	French Area Studies and Transportation	KZ	2
France - geography and regions, transport infrastructure. Paris and its sights, city public transport. Road traffic, motorways, railway traffic, TGV, air traffic, specialised terminology. French society and culture. Current political system. System of education, studying in France. Selected authors of French literature. French gastronomy.			
15Y1HD	History of City Mass Transport	KZ	2
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.			
15Y1HE	Work Hygiene and Ergonomics in Traffic	KZ	2
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 a man. Practical examples from the field of transportation; relevant legislature.			
15Y1HL	History of Air Transport	KZ	2
Aeronautics. Beginnings of aircrafts heavier than air. Czechoslovak aviation pioneers. Development of airports in the Czech Republic. World airports. Airlines of the world. Helicopters. CSA airplanes. Famous aviators. Classic era of aviation. Golden era of civil aviation. Supersonic flying. Modern era of civil aviation. Flying in the world.			
15Y1MK	Modern History in Context: Every Day Life and Transport	KZ	2
Historical overview of modern history of every day life, science, technology and transport in a wider context.			
15Y1NE	German in the Economy and Society	KZ	2
Recent economic and social issues of German speaking countries and of the EU. Reading and listening of texts. Lexical, grammatical and semantic analysis of texts. Discussion on selected topics.			
15Y1ZV	East-West dichotomy: Prelude to the Cold War	KZ	2
Historical prologue, evolution of the "West" and "East" from the 1500s. Focus on the history in the period between 1850 nad 1950. Milestones and continuity of the international relations in the end of 19th century and the beginning of the 20th century. Revolutions, the causes and consequences. Scientific and technological progress, the causes and consequences. Economic and financial history. Social changes. Discussions on texts, sources.			
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.			
16X31	Project 1	Z	2
16X32	Project 2	Z	2
16X33	Project 3	Z	2
16Y1EN	Energy Requirements of Vehicles	KZ	2
Dynamics and the driving inertial of the vehicles. Types of energy - kinetic, static, heat, chemical and others. Ways of energy change into kinetic energy. Combustion engine, electric drive, steam engine, air engine. Energy accumulation means, accumulator, flywheel, fuel cell. Energy recuperation. WTW analysis.			
16Y1IS	Interactive Systems and Simulations	KZ	2
Principles of vehicle movement. Forces in moving vehicle, origin, classification, assesment. Adhesion. Traction output. Drives, source systems, classification, structure, operational and energetic singularity. Sources of energy. Calculations to assess output quantities and energetic intensity. Auxiliary systems energy consumption.			
16Y1KS	Quality and Reliability of Vehicles	KZ	2
Quality and reliability theory in design, development, production and operation of vehicles. Definition and possible approach to quality and reliability. Key legislation. FMEA (Failure Mode and Effects Analysis), QFD (Quality Function Deployment), DFx (Design for Assamly, Manufacturying, Quality, Services ...) and other methods used in industrial applications. Knowledge-based systems of quality and reliability, data collection.			
16Y1PV	Operation, Construction and Maintenance of Vehicles	KZ	2
Methods of vehicle production. Vehicle maintenance. Vehicle diagnostics. Maintenence and repair plans. Engine maintenance and emission measurement. Transmission mechanism. General principles of engine diagnostics.			
16Y1RE	Control and Electronic Vehicle Systems	KZ	2
Elementary concepts of regulation. Tools for analytical solution, linear system description. Basic types of a regulator (PID), properties, advantages, disadvantages, function. Conventional and hybrid drive control. Electric drive. Vehicle communication bus (CAN, LIN, FlexRay, ISObus, KWP2000 protocole etc.). Vehicle electronic control, safety, communication and comfort systems.			
16Y1VT	Development in Railroad Vehicles	KZ	2
Railroad vehicles traction. Railroad vehicle parametres regulation. Control and driving of railroad vehicles. Importance in heavy duty and personal transportation. Critical situation assesment. New materials in design. International standardization.			
16Y1ZG	Introduction into Applied Computer Graphics	KZ	2
Computer graphics, division and applications with emphasis on transport, including development and research. Colours, colour perception, colour schemes, models, principles of 2D and 3D generation, elementary algorithms for graphic data workout. Visualisation principles and tasks, technics, graphics and visualisation HW basics. Introduction to 2D and 3D graphics software.			

16Y1ZL	Vehicle Testing, Legislation and Construction	KZ	2
Vehicle, bus and motorbike costruction, aggregate computing, driving resistance, build and parameters of traction, constructional arrangement of personal cars, trucks, buses, motorbikes, legislation in the EU and in the world, technical legislation creation, testing methods, vehicle tests, accelerated tests, mathematical modelling in testing.			
17TEDL	Transport Technology and Logistics	KZ	3
Basic terms in transport technology and logistics, particular steps of transport planning, line planning, timetabling, planning in pasanger 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 aplication 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.			
17X31	Project 1	Z	2
17X32	Project 2	Z	2
17X33	Project 3	Z	2
17Y1LL	Logistics of Passenger and Freight Air Transport	KZ	2
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.			
17Y1MD	Marketing in Transportation	KZ	2
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.			
17Y1OF	Personal Finance	KZ	2
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).			
17Y1PM	Personnel Management	KZ	2
Human sources, work group, man as personality, planning, choice, evaluation and education of human sources, work adaptation, teamwork, intercultural communication.			
17Y1SL	Sociology of Human Resources	KZ	2
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.			
17Y1ST	Titan Simulation	KZ	2
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.			
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.			
18X31	Project 1	Z	2
18X32	Project 2	Z	2
18X33	Project 3	Z	2
18Y1AM	Anatomy, Mobility and Safety of Man	KZ	2
Survey of tissues. Anatomical structure and growth of bones. Articular joint. Remodelling of bone tissue. Anatomical structure of muscles. Blood circulation and nervous system. Structure and biomechanics of muscular-skeletal system. Injury of human organs and musculo-skeletal system during traffic accidents. Mobility of ill and injured man and his treatment. Human joint prostheses. Protective means and traffic safety regulations.			
18Y1EM	Experimental Methods in Mechanics	KZ	2
The purpose and role of experimental mechanics. Sensors for mechanical testing. Overview of experimental methods. Destructive and non-destructive testing of materials. Design of experimental procedures and sample preparation. Tensile and bending tests. Electrical resistance strain gages. Optical based strain measurement. Fatigue and lifetime prediction. Instrumented hardness testing. Introduction to electron microscopy. Errors in measurement.			
18Y1MT	Engineering Materials	KZ	2
Systematic overview of main classes of materials used in technical design. In addition to main classes of materials, i. e. metals, ceramics, polymers and composites, attention is paid to biological materials and to biomimetics. Integral approach to material selection process is also demonstrated based on so called Ashby's selection charts.			
18Y1PS	Computer Simulations in Mechanics	KZ	2
Principles and overview of programs for stress analysis of structures. Numerical methods in mechanics, finite element method. Geometric model development and adaptation of geometry from other CAE systems. Assignment of material properties. The types of elements and their use. Discretization of solid model. Boundary conditions and application of the load. Basic tasks of structural and modal analysis. Introduction to complex nonlinear problems.			
18Y1UK	Introduction of Rail Vehicles	KZ	2
Basic characteristics and parameters rail transport systems - railway and urban transport. Basis driving mechanics rail vehicles - equation of motion train and unit trains. Rolling and track resistance. Total running resistance. Acceleration force. Analyzing driving cycle rail vehicle. Speed-power diagrams and characteristics rail vehicle - hydromechanic, hydrodynamic and electric drive. Design concept rail vehicles and drive of wheel set.			
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.			
20X31	Project 1	Z	2
20X32	Project 2	Z	2
20X33	Project 3	Z	2
20Y1AE	Applied Electronics	KZ	2
Basic electronic semiconductor components, their principles, characteristics and typical connection diagrams. Semiconductor PN junction diodes, transistors, thyristor, operational amplifiers, basic logic gates. Functions of basic electronic circuits and methods for their designs (rectifiers, voltage regulator with Zener diode, transistor as an amplifier, operational amplifier as an inverting and noninverting amplifier).			
20Y1AF	Alternative Forms of Transportation Project Financing	KZ	2
In will be specifed such forms of financing in transportation and telecomunications, where the public sector body perform the final debtor, i. e. debt 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 and telecomunication projects.			
20Y1EA	Environmental Aspects of Transport	KZ	2
State of the atmosphere, weather observation network, weather in transportation, road meteorology. Weather forecasting, data assimilation, probabilistic forecasts, forecast evaluation. Air quality, main pollutants and their effects, atmospheric chemistry, traffic emissions. Greenhouse gasses, carbon cycle, a role of energy and transportation in climate change.			
20Y1EK	Qualification in Electrical Engineering	KZ	2
Practical experience with measurements in laboratories, electrical equipment, power supply, electrical installation of low voltage, electric shock hazard, symbols and labeling, nominal voltage, maximum allowed currents, electrical equipment protection against short circuit and overload protection, control and revision, first aid, legislation, standards and regulations in relation to health and safety and electrical engineering.			
20Y1LN	Location and Navigation	KZ	2
Description and examples of road networks, localization on the network. Routing algorithms, their properties and implementation. Description and examples of datasets for finding transport connections, routing algorithms, their properties and implementation.			
20Y1OI	Fare Collection and Information Systems	KZ	2
Fare collection systems in public transport and their components (on-board units, validators, turnstiles, ...). Information systems and their components for users (timetables, maps, panels ...) and operators (cycles, location or current delay of vehicles, ...). The issue of tariff systems. Other examples of clearance systems (parking).			
20Y1PK	Product Quality Management Processes	KZ	2
General principles of organization management. Management systems and international standards; quality management systems. Quality products, processes, systems. A framework of standards for systems management, management principles. Principles of process management, monitoring and measurement systems management. Uniform framework of standards for systems management. Process management principles. Metrology and testing. Product certification.			
20Y1SC	Sensors and Actuators	KZ	2
Principles of sensors and actuators. Basics of measuring theory and actuating influence. The respective technologies and construction principles. Sensors of mechanical, electro-magnetic, state (temperature, humidity), chemical and particle flow values. Electrical, pneumatic and hydraulic actuators and solid phase elements.			
21ELED	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 asignment. Aging of aircraft. Airlines bankrupcty. Crew planning. Marketing in Air Transport. Cargo tariff and rates. Air network configuration.			
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 in Aviation 2	KZ	3
Terminology in the sphere of aircraft construction, principles of flight, aircraft engines, instruments and systems.			
21LCM	Aircraft Engines	Z,ZK	3
Aircraft piston engine, theoretical background, operational characteristics and construction schemes. Propellers, operational charactericticts. Turbine engine, theoretical background, thermal cycles, construction schemes, operational characteristics. Turbojet and turbofan engines, basic construction modules, and their operational characteristics. Engine control.			
21LGP	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.			
21LIVO	Human Performance and Limitations	Z,ZK	5
Human performace & 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.			
21LL1	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.			
21LTA2	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.			
21LTN	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.			
21LTTE	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.			
21MRG	Meteorology	KZ	3
Structure of atmosphere. Vertical stratification. Pressures QNH, QFE, QFF, QME. Instability. Atmospherical fronts. Atmospherical 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.			

21OBP	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.			
21PAP	Flight Planning and Performance	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.			
21PDLE	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.			
21PJE	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.			
21RILP	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.			
21ULCT	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.			
21X31	Project 1	Z	2
21X32	Project 2	Z	2
21X33	Project 3	Z	2
21Y1BC	Aviation safety and security	KZ	2
History of safety and security development in aviation. Modern tools for safety and security management. Research and development of safe and secure systems.			
21Y1BS	Unmanned aircraft systems 1	KZ	2
Unmanned Aviation Development. Aircraft design. Legislation in force in the Czech Republic. Planning and execution of the flight. Airspace division. Operational risks and operational procedures. Practical flights.			
21Y1FN	Factors Affecting the Rate of Accidents in Aviation	KZ	2
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.			
21Y1LA	Aerobatics	KZ	2
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.			
21Y1LR	Radio Technology in Aviation	KZ	2
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.			
21Y1MP	Matlab for project-oriented study	KZ	2
The subject's syllabus is focused on the problem-solving during bachelor's thesis preparation and it is based on students' requests. Individual exercises will be prepared according to particular examples, based on actual students' needs and suggestions. The subject will have a flexible form, which is expected to bring an improvement of students' Matlab skills.			
21Y1MZ	Managerial Ethics	KZ	2
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.			
21Y1RZ	Human Resources Management	KZ	2
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.			
21Y1TH	Aircraft Technical Handling	KZ	2
Aircraft towing and pushing tractors. GPU. Air conditioning and heating units. Aircraft fuel equipment. De-acing and anti-icing units. Loading and unloading units. Equipment for passangers onboarding and offboarding. Operational processes of aircraft technical handling and regulations. Modernization and technical progress.			
21Y1UT	Airports Maintenance	KZ	2
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.			
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.			
21ZT	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.			
21ZYL1	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.			

21ZYL2	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, manoevures, stability and controllability, transsonic speeds.			
22X31	Project 1	Z	2
22X32	Project 2	Z	2
22X33	Project 3	Z	2
22Y1SZ	Forensic Expertise	KZ	2
Historical evolution of forensic engineering, forensic activity, current legislature in the Czech Republic, different disciplines, notion of forensic, forensic legislation, basic forensic acts, expert role in the obtaining proofs, forensic methodology. Notion of the evidence, general principles of evidence obtaining, metrology, protocol, evidences collection, site inspection, forensic report, elements. Finding, expert testimony / report.			
23X31	Project 1	Z	2
23X32	Project 2	Z	2
23X33	Project 3	Z	2
23Y1DZ	Data and Their Processing for Engineering Fields Needs	KZ	2
Courses of risk, basic terms, data collection, data sets, data random uncertainty and data epistemic uncertainty, data processing, hazard, risk, value scales, analytical, empirical and heuristic methods, hazard determination and risk determination, methods for variants´ creation, decision support systems.			
23Y1KO	Quantum Physics and Optoelectronics	KZ	2
Ground of quantum physics. Application of quantum physics in practice. Optoelectronics. Production of optoelectronics components.			
23Y1OK	Protection of Critical Objects and Infrastructures	KZ	2
Types of technological systems, critical item, risks and their courses, criticality, vulnerability, connectivity, dependability, resilience, failure, protection, safety of critical objects and critical infrastructures.			
23Y1VS	Negotiation and Cooperation	KZ	2
Code of conduct for negotiation. The influence of personality traits on the negotiations. Negotiation and commanding. Teamwork. Variants teams. Informal and formal role in the team. Principles of negotiation, the essence of negotiation, the differences in negotiation in business and in crisis situations, the principle of "win both", specifications and bidding, the role of trust.			
TV-1	Physical Education	Z	1
TV-2	Physical Education	Z	1

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