

Study plan

Name of study plan: LOG bak.prez.16/17

Faculty/Institute/Others:

Department:

Branch of study guaranteed by the department: Welcome page

Garantor of the study branch:

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: Compulsory courses

Minimal number of credits of the block: 90

The role of the block: Z

Code of the group: 1.S.BP 15/16

Name of the group: 1.sem.bak.prez. od 15/16

Requirement credits in the group: In this group you have to gain 28 credits

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

Credits in the group: 28

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 Olga Vraštilová, Tomáš Tasák, Magdalena Hykšová, Bohumil Ková, Ondřej Navrátil Bohumil Ková Ondřej Navrátil (Gar.)	Z,ZK	7	2P+4C+2B	Z	Z
11LA	Linear Algebra Lucie Kárná, Pavel Provinský, Martina Beváová Martina Beváová Martina Beváová (Gar.)	Z,ZK	3	2P+1C+10B	Z	Z
12ZYDI	Introduction to Transportation Engineering Vojtěch Novotný, Zuzana Arská, Dagmar Kořáková	Z,ZK	2	1P+1C	Z	Z
18MTY	Materials Science and Engineering Nela Krnáčová, Jan Falta, Radim Dvořák, Václav Rada, Jitka Ezníková, Jaroslav Valach, Jaroslav Valach Jaroslav Valach (Gar.)	Z,ZK	3	2P+1C+10B	Z	Z
20SYSA	Systems Analysis Zuzana Bělinová, Jiří Růžka, Petr Bureš Zuzana Bělinová (Gar.)	Z,ZK	5	2P+2C+14B	L	Z
11GIE	Geometry Pavel Provinský, Oldřich Hykš, Šárka Voráčová Oldřich Hykš Oldřich Hykš (Gar.)	KZ	3	2P+2C+12B	Z	Z
18TED	Technical Documentation Jitka Ezníková, Vít Malinovský Jitka Ezníková (Gar.)	KZ	2	1P+1C+8B	Z	Z
16UDOP	Introduction into Vehicles Zuzana Radová, Petr Bouchner	Z	2	2P+0C+8B	Z	Z
TV-1	Physical Education	Z	1		Z	Z

Characteristics of the courses of this group of Study Plan: Code=1.S.BP 15/16 Name=1.sem.bak.prez. od 15/16

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 Eukclidean 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.			

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.			
11GIE	Geometry	KZ	3
Differential geometry of curves - parameterization, the arc of the curve, torsion and curvature, Frenet's trihedron. Kinematics - a curve as a trajectory of the motion, the velocity, and acceleration of a particle moving on a curved path.			
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.			
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: 1.S.BP VÝB R 15/16

Name of the group: 1.sem.bak. prez výb r p edm tu od 15/16

Requirement credits in the group: In this group you have to gain 2 credits

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

Credits in the group: 2

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
14AS	Algorithm and Data Structures	KZ	2	0+2	Z	z
14AZ	Data Analysis and Processing	KZ	2	0+2	Z	z
14DB	Database Systems	KZ	2	0+2	Z	z

Characteristics of the courses of this group of Study Plan: Code=1.S.BP VÝB R 15/16 Name=1.sem.bak. prez výb r p edm tu od 15/16

14AS	Algorithm and Data Structures	KZ	2
Students will be familiarized with selected basic and derived data structures, algorithms, their properties and their design procedure. Students will analyze problems, propose theoretical solutions to the set task and the resulting algorithm write by means of flowcharts, practice in reading algorithms recorded by means of the flowchart and use the basics of Boolean algebra with forming the conditions for the algorithms.			
14AZ	Data Analysis and Processing	KZ	2
Main aim of this course is learn students how to prepare raw data for following processing and analysis. Knowledge of algorithms for determining the parameters of different data sources; source can be used images, text, time series, etc. The next step is the theoretical skills and knowledge to apply in solving the problem, e. g. extraction parameters from the image data or from the Internet.			
14DB	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.			

Code of the group: 2.S.BP 15/16

Name of the group: 2.sem.bak.prez. 15/16

Requirement credits in the group: In this group you have to gain 28 credits

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

Credits in the group: 28

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
11CAL2	Calculus 2 <i>Olga Vraštilová, Tomáš Tasák, Magdalena Hykšová, Ondřej Navrátil, Oldřich Hykš Ondřej Navrátil Ondřej Navrátil (Gar.)</i>	Z,ZK	5	2P+3C+2B	L	z
11FY1	Physics 1	Z,ZK	4	2P+2C	L	z
11STAS	Statistics <i>Ivan Nagy</i>	Z,ZK	5	2P+2C	L	z
12ZTS	Railway Lines and Stations <i>Lukáš Týfa, Petr Šatra, Martin Jacura, Tomáš Javořík, Ondřej Trešl Lukáš Týfa (Gar.)</i>	Z,ZK	4	2P+2C+1B	L	z
18SAT	Structural Analysis <i>Nela Králová, Jan Falta, Jitka Ježníková, Daniel Kytý, Jan Vyhlídal, Tomáš Doktor, Jan Šleicher Daniel Kytý (Gar.)</i>	Z,ZK	4	2P+2C+1B	L	z
17TEDL	Transport Technology and Logistics <i>Michal Drábek, Zdeněk Michl, Milan Kříž, Jiří Pospíšil, Rudolf Vávra</i>	KZ	3	2P+1C	L	z

21ZALD	Basics of Air Transport <i>Jakub Hospodka, Tomáš Tluhoš, Jiří Volt, Peter Olexa, Jan Slezáček, Jakub Trýb</i>	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 15/16 Name=2.sem.bak.prez. 15/16

11CAL2	Calculus 2				Z,ZK	5
Indefinite integral, Newtonian integral, Riemannian integral of the function of one variable, improper Riemannian integral, Riemannian integral in R^n . Parametric description of regular k -dimensional surfaces in R^n , Riemannian integral over regular surfaces. Line and surface integrals of the second type, Stokes theorems, ordinary differential equations of the first order, linear differential equations with constant coefficients and its systems						
11FY1	Physics 1				Z,ZK	4
Kinematics, particle dynamics, dynamics of particle systems and rigid body. Continuum mechanics, thermodynamics, electric field, directed electric current.						
11STAS	Statistics				Z,ZK	5
Definition of probability, random variable and its description, known distributions, random vector, function of random variable. Methods of point estimation. Testing of statistical hypothesis. Regression and correlation, linear regression, correlation coefficient, coefficient of determination, the general linear model, statistical inference in linear regression, analysis of variance, multiple regression, the use of matrices in regression.						
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.						
17TEDL	Transport Technology and Logistics				KZ	3
Basic terms in transport technology and logistics, particular steps of transport planning, line planning, timetabling, planning in passenger and freight transport, organisation of traffic in each transport modus, technologic factors of the side of operator and client, organisation of city transport, logistic technologies and their application using various transport modus.						
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: 2.S.BP VÝB R 15/16

Name of the group: 2.sem.bak. prez výb r p edm tu od 15/16

Requirement credits in the group: In this group you have to gain 2 credits

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

Credits in the group: 2

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
14KSP	Constructing with Computer Aid <i>Martin Brumovský, Martin Fiala, Radek Kratochvíl, Lukáš Svoboda, Jan Vogl, Drahomír Schmidt Lukáš Svoboda Drahomír Schmidt (Gar.)</i>	KZ	2	0P+2C+8B	Z	z
14PRG	Programming <i>Martin Fiala, Lukáš Svoboda, Jana Kalíková, Jan Král, Alena Plašilová, Jan Procházka Jan Král Jana Kalíková (Gar.)</i>	KZ	2	0P+2C+8B	L	z

Characteristics of the courses of this group of Study Plan: Code=2.S.BP VÝB R 15/16 Name=2.sem.bak. prez výb r p edm tu od 15/16

14KSP	Constructing with Computer Aid				KZ	2
"CAD systems" term determination. CAD role in projecting system model. Existing CAD systems on Czech market. Project creation, basic common work rules in graphic applications and CA systems. Co-ordinated systems, CAD environment skill (basics of constructing, dimensioning, modifications, user interfaces, projecting possibilities, AutoCAD environment profiles, drawings with raster foundations).						
14PRG	Programming				KZ	2
The Course Programming builds on and fully extends the course 14ASD (Algorithmization and Data Structures). The knowledge of the Python programming language is expanded here so that the participant gains skills and can apply them to solve various follow-up tasks. Main topics: lists, multidimensional arrays, sorting and searching, tuples, sets, dictionaries, working with date and time, regular expressions, functions and procedures, working with files (CSV, JSON, XML).						

Code of the group: 3.S.BP 16/17

Name of the group: 3.sem.bak.prez.od 16/17

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) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
11FY2	Physics 2	Z,ZK	4	2+2	Z	z
12MDE	Transport Models and Transport Excesses <i>Milan Dont, Josef Kocourek</i>	Z,ZK	3	2P+1C+8B	Z	z
17TGA	Graph Theory and its Applications in Transport <i>Alena Rybíková, Denisa Mocková, Dušan Teichmann</i>	Z,ZK	4	2P+2C+12B	Z	z
18PZP	Elasticity and Strength <i>Nela Králová, Jan Falta, Radim Dvořák, Jitka Jeřínková, Daniel Kytý, Jan Vyšchl, Tomáš Doktor, Jan Šleicher, Tomáš Fila,</i>	Z,ZK	3	2P+1C+10B	Z	z
20UITS	Introduction to Intelligent Transport Systems <i>Jiří Růžka, Patrik Horažovský, Kristýna Navrátilová, Viktor Beneš, Eva Hájárová, Martin Langr, Vladimír Faltus, Pavel Hrubeš</i>	Z,ZK	7	3P+2C+20B	Z	z
12PPOK	Designing Roads, Highways and Motorways <i>Petr Šatra, Josef Kocourek, Tomáš Padlák, Petr Kumpošt</i>	KZ	3	1P+2C+10B	Z	z
23BDIS	Safety Technologies of Transportation and Information Systems	KZ	3	2+0	Z	z
15JZ1A	Foreign Language - English 1 <i>Markéta Vojanová, Dana Boušová, Marie Michlová, Barbora Horáková, Marek Tomek, Jan Feit, Markéta Musilová, Peter Morpuss, Lenka Monková,</i>	Z	3	0P+4C+10B	Z	z

Characteristics of the courses of this group of Study Plan: Code=3.S.BP 16/17 Name=3.sem.bak.prez.od 16/17

11FY2	Physics 2	Z,ZK	4
Magnetic field, electromagnetic field. Optics, quantum character of electromagnetic radiation. Introduction into quantization, hydrogen atom. Multi-electron atoms, the nuclei. Basics of solid body physics.			
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 in bending of beam. Design and analysis of cross section of beam. Design of riveted, bolted and welded joints of structures. Analysis of deflection curve of beams. Torsion of circular cross sections. Combined loading. Stability.			
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.			
23BDIS	Safety Technologies of Transportation and Information Systems	KZ	3
Safety of transportation means - principles, testing, evaluation. Safety of infrastructures, critical structures, crisis scenarios. Safety of information systems and their robustness.			
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.			

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. (od)13/14 - pro B3710

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

Requirement courses in the group: In this group you have to complete 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) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
11X31	Project 1	Z	2	0P+1C	L	ZP
12X31	Project 1	Z	2	0P+1C	L	ZP
14X31	Project 1	Z	2	0P+1C	L	ZP
15X31	Project 1	Z	2	0P+1C	L	ZP

16X31	Project 1	Z	2	0P+1C	L	ZP
17X31	Project 1 <i>Michal Drábek, Zdeněk Michl, Milan Kříž, Jiří Pospíšil, Rudolf Vávra, Alena Rybíková, Denisa Mocková, Dušan Teichmann, Roman Štrba, Václav Baroch (Gar.)</i>	Z	2	0P+1C	L	ZP
18X31	Project 1	Z	2	0P+1C	L	ZP
20X31	Project 1 <i>Jiří Růžka</i>	Z	2	0P+1C	L	ZP
21X31	Project 1 <i>Jakub Hospodka, Jakub Kraus, Andrej Lališ, Slobodan Stojić, Lenka Hanáková, Terézia Pilmannová, Peter Vittek, Natalia Guskova, Kateřina Grötschelová,</i>	Z	2	0P+1C	L	ZP
22X31	Project 1	Z	2	0P+1C	L	ZP
23X31	Project 1 <i>Milena Macková</i>	Z	2	0P+1C	L	ZP
11X32	Project 2	Z	2	0P+2C	Z	ZP
12X32	Project 2	Z	2	0P+2C	Z	ZP
14X32	Project 2	Z	2	0P+2C	Z	ZP
15X32	Project 2	Z	2	0P+2C	Z	ZP
16X32	Project 2 <i>Petr Bouchner, Tereza Kunclová</i>	Z	2	0P+2C	Z	ZP
17X32	Project 2 <i>Michal Drábek, Zdeněk Michl, Milan Kříž, Jiří Pospíšil, Rudolf Vávra, Alena Rybíková, Denisa Mocková, Dušan Teichmann, Andrea Hrníková,</i>	Z	2	0P+2C	Z	ZP
18X32	Project 2	Z	2	0P+2C	Z	ZP
20X32	Project 2	Z	2	0P+2C	Z	ZP
21X32	Project 2 <i>Jakub Hospodka, Jakub Kraus, Andrej Lališ, Slobodan Stojić, Lenka Hanáková, Terézia Pilmannová, Peter Vittek, Natalia Guskova, Lukáš Popek,</i>	Z	2	0P+2C	Z	ZP
22X32	Project 2	Z	2	0P+2C	Z	ZP
23X32	Project 2	Z	2	0P+2C	Z	ZP
11X33	Project 3	Z	2	0P+1C	L	ZP
12X33	Project 3 <i>Dagmar Kořádková, Josef Kocourek, Tomáš Padělek</i>	Z	2	0P+1C	L	ZP
14X33	Project 3	Z	2	0P+1C	L	ZP
15X33	Project 3	Z	2	0P+1C	L	ZP
16X33	Project 3	Z	2	0P+1C	L	ZP
17X33	Project 3 <i>Michal Drábek, Zdeněk Michl, Milan Kříž, Jiří Pospíšil, Rudolf Vávra, Alena Rybíková, Denisa Mocková, Dušan Teichmann, Roman Štrba, Václav Baroch (Gar.)</i>	Z	2	0P+1C	L	ZP
18X33	Project 3	Z	2	0P+1C	L	ZP
20X33	Project 3	Z	2	0P+1C	L	ZP
21X33	Project 3 <i>Andrej Lališ, Slobodan Stojić, Lenka Hanáková, Terézia Pilmannová, Lukáš Popek, Iveta Kameníková, Milan Kameník, Marek Šudoma, Viktor Valenta,</i>	Z	2	0P+1C	L	ZP
22X33	Project 3	Z	2	0P+1C	L	ZP
23X33	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. (od)13/14 - pro B3710

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

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

Name of the block: Compulsory courses in the program

Minimal number of credits of the block: 72

The role of the block: P

Code of the group: 4.S.BLOG 16/17

Name of the group: 4.sem.LOG bak.prez.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) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
11MSP	Modeling of Systems and Processes <i>Bohumil Ková , Lucie Kárná, Jana Kuklová Jana Kuklová Bohumil Ková (Gar.)</i>	Z,ZK	4	2P+2C+12B	L	P
17LGT	Logistics <i>Daniel Pilát, Tomáš Horák, Eliška Glaserová Tomáš Horák (Gar.)</i>	Z,ZK	6	3P+2C+18B	L	P
17SFID	Public Administration and Financing in Transport	Z,ZK	4	2P+1C+12B	L	P
11LP	Linear Programming <i>Šárka Vorá ová, Karel Je men, Ivan Nagy Ivan Nagy Ivan Nagy (Gar.)</i>	KZ	3	2P+1C+12B	L	P
16DPO	Vehicle Technology <i>Josef Mík, Josef Svoboda, P emysl Toman Josef Mík (Gar.)</i>	KZ	2	2P+0C+10B	L	P
17EMY	Management Science	Z	2	2P+0C+8B	L	P
17PAZ	Carriage and Forwarding	Z	2	2P+0C+8B	L	P
15JZ2A	Foreign Language - English 2 <i>Markéta Vojanová, Dana Boušová, Marie Michlová, Barbora Horá ková, Marek Tome ek, Jan Feit, Markéta Musilová, Peter Morpuss, Lenka Monková,</i>	Z,ZK	3	0P+4C+10B		P

Characteristics of the courses of this group of Study Plan: Code=4.S.BLOG 16/17 Name=4.sem.LOG bak.prez.16/17

11MSP	Modeling of Systems and Processes	Z,ZK	4
System and subsystem, external and internal system description, continuous and discrete system, mathematics as a tool, examples of formulation of differential and differential equations. Linear and nonlinear system, stationary and non-stationary system, causality. Convolutional integral. Laplace and Z transformations. Transfer function. Stability of LTI systems. Discretization of continuous systems. System interconnection.			
17LGT	Logistics	Z,ZK	6
Logistics definition, basic concepts, store, warehouse, transport and handling equipment, logistics technology, logistics centers, information and intelligent logistics systems, logistics city.			
17SFID	Public Administration and Financing in Transport	Z,ZK	4
Basic issues of transport and transport policy in the social context, environmental issues in transport, economical aspects of transport, public administration and financing of transport.			
11LP	Linear Programming	KZ	3
Formulation of the problem of linear programming, transcription of some practical problems to the linear programming problems. Simplex and convex polyedra. Simplex method, basic solutions, duality principle in linear programming, stability of solution of linear programming problem. Traffic problem.			
16DPO	Vehicle Technology	KZ	2
Vehicle. Functions, principles. Drive, vehicle construction. Road transport, safety, heavy duty vehicle desing, dynamics. Rail transport, safety, carriage design. Drive. Electric traction. Transshipment. Technological components of various modes of transport. Management and control of various means of transport. Safety.			
17EMY	Management Science	Z	2
The introduction to economical-mathematical models before its application in concrete technical and economical cases. The basic mathematical methods to modelise economical situations. Several classes of problems are formulated and different methods used in qualitatively distinct real situations are introduced. The tasks of interpretation and application.			

17PAZ	Carriage and Forwarding	Z	2
Contracts of carriage and forwarding, waybills and documents; transport modes, multimodal transport, tariffs and prices in transport, rights and obligations of carriers, hauliers and forwarders, duty and tariff agreements, INCOTERMS, insurance in transport.			
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.BLOG 17/18

Name of the group: 5.sem.LOG bak.prez.17/18

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

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

Credits in the group: 23

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
17EDPO	Economics of Transport Company	Z,ZK	5	2P+2C	Z	P
17FEU	Public Administration and Financing in Transport	Z,ZK	4	2P+1C	Z	P
17MAS	Small and Medium Enterprise	Z,ZK	3	2P+1C	Z	P
17TVD	Technology of Public Transport <i>Zdeněk Michl, Jiří Pospíšil, David Juřík, Vít Janoš Vít Janoš (Gar.)</i>	Z,ZK	5	2P+2C+1B	Z	P
14DMG	Datamining <i>Radek Holý Radek Holý (Gar.)</i>	KZ	2	0P+2C+10B	Z	P
17MEKA	Methods of Economics Analysis	KZ	2	2P+0C	Z	P
23ZAP	Basics of Law <i>Milena Macková Milena Macková Milena Macková (Gar.)</i>	Z	2	2P+0C+10B	Z	P

Characteristics of the courses of this group of Study Plan: Code=5.S.BLOG 17/18 Name=5.sem.LOG bak.prez.17/18

17EDPO	Economics of Transport Company	Z,ZK	5
Economy, marginal utility, marginal costs, function of supply and demand, market equilibrium, perfect competition and types of market arrangement. Transportation market, transport company, its environment, balance sheet, costs, revenue, profit and maximalization of profit. Financial management in transport, business plan, taxation in transport.			
17FEU	Public Administration and Financing in Transport	Z,ZK	4
To get a basic overview of the EU regional policy and its practical execution on the level of the member state, specific ability to find and analyze information about the EU support programmes.			
17MAS	Small and Medium Enterprise	Z,ZK	3
Small and medium enterprise - plans, market, analysis, finance, management, decision making, survival, growth.			
17TVD	Technology of Public Transport	Z,ZK	5
The course contains a detailed description of new knowledge and basic principles of hierarchical planning of public transport system accenting the general transport planning and quantified transport demand. The course would be oriented on multiple and multi-level optimisation of passenger public transport system.			
14DMG	Datamining	KZ	2
Types of data sources and knowledge, data warehouses and OLAP technology for data mining, data preprocessing in the process of knowledge acquisition systems for data mining, mining characteristics of concepts (classes), mining association rules from relational db. and data warehousing, classification (decisions tree, Bayesian cob., using neural networks). Prediction. Cluster analysis. Mining in complex structured data, multimedia dbf., www.			
17MEKA	Methods of Economics Analysis	KZ	2
The techniques of economical analysis in the domain of analysis of dependencies, analysis and construction of time series and comparison of statistical values using differences and indices.			
23ZAP	Basics of Law	Z	2
Basic orientation in the Czech legal system. The course is primarily intended to provide students with orientation in fundamentals of the Czech Republic, legal system and in various forms of law, including adoption of the basic principles of European Community law. The course consists of selected chapters from the public and private law and European Community law.			

Code of the group: 6.S.BLOG 17/18

Name of the group: 6.sem.LOG bak.prez.17/18

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

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

Credits in the group: 23

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
17IVD	Integration of Public Transport	ZK	4	3P+0C+12B	L	P
17RAC	Rationalization and Quality of Transport	Z,ZK	7	4P+2C+22B	L	P

17RPT	Project Management	Z,ZK	5	2P+2C+14B	L	P
14MPG	Modern Programming Approaches <i>Vít Fábera, Michal Jeábek Vít Fábera (Gar.)</i>	KZ	2	0P+2C+8B	L	P
17GEDS	Geography of Transport Systems <i>Miroslav Marada Miroslav Marada (Gar.)</i>	KZ	2	2P+0C+8B	L	P
17MRZ	Managerial Decision Making	Z	2	2P+0C+8B	L	P
23DPSP	Traffic Law and Related Regulations	Z	1	2P+0C+8B	L	P

Characteristics of the courses of this group of Study Plan: Code=6.S.BLOG 17/18 Name=6.sem.LOG bak.prez.17/18

17IVD	Integration of Public Transport	ZK	4	Transport policy, planning, contracts, funding, clearing of traffic receipts, tariff systems, traffic and carriage controls, legal conditions within public transport.		
17RAC	Rationalization and Quality of Transport	Z,ZK	7	Transport system, transportation funding, cost calculation, efficiency, transport rationalization, quality management, standards and quality standardization, quality management systems, quality management in transport and logistics, marketing and transport quality, quality costs, quality measurement and monitoring, statistics in quality management, improving, focus on the customer.		
17RPT	Project Management	Z,ZK	5	Basic terms of the project management, project management standards, organizational structures in the project management, projects in transport and transport infrastructure and their specifics, feasibility study and CBA, project evaluation, PPP projects.		
14MPG	Modern Programming Approaches	KZ	2	Principles of object oriented programming, polymorphism, references, memory allocation, inheritance, generic programming, operator overloading, STL library, object implementation of abstract data types, graph and graph algorithm implementation focused on logistic problems.		
17GEDS	Geography of Transport Systems	KZ	2	Regional differentiation of the transport system. Sociogeographic regionalization and its relation to transport. Transport and local and regional development. Spatial interaction - theoretical and methodological framework. Mobility research - travel behavior, mode choice and the influence onto "modal-split." Modal competition. Practical use of transport-geographical analysis in transportation planning.		
17MRZ	Managerial Decision Making	Z	2	The course is divided into two main sections. The first section deals with individual-level processes that influence managers' decisions. The second section considers collective (that is, group or organizational) forces that affect managers' decisions.		
23DPSP	Traffic Law and Related Regulations	Z	1	Analysis of selected laws in transportation domain (e. g. Road Act, Road Transport Act, Civil Aviation Act, Railways Act, Inland Navigation Act), selected EU transport legislation.		

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-BLOG 16/17

Name of the group: PVP bak.prez.LOG 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 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) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
17Y1AF	Alternative Forms of Transportation Project Financing	KZ	2	2+0	Z	PV
18Y1AM	Anatomy, Mobility and Safety of Man <i>Jitka Jírová</i>	KZ	2	2P+0C	Z	PV
14Y1AV	Animation and Visualization	KZ	2	2P+0C	L	PV
20Y1AE	Applied Electronics	KZ	2	2P+0C	Z	PV
14Y1BE	Barrierless Transport <i>Jan Král</i>	KZ	2	2P+0C	L	PV
15Y1BO	Work Safety and Health Protection in Transportation <i>Eva Rezlerová, Petr Musil</i>	KZ	2	2P+0C	L	PV
14Y1BM	Biometric Methods	KZ	2	2P+0C	Z	PV
23Y1DZ	Data and Their Processing for Engineering Fields Needs	KZ	2	2P+0C	Z	PV
15Y1DU	History of Art and Society	KZ	2	2+0	Z	PV
15Y1DZ	History of Railway <i>Martin Jacura, Eva Rezlerová</i>	KZ	2	2P+0C	L	PV
12Y1DS	Project Documentation in Practice	KZ	2	2P+0C	Z	PV
17Y1EV	Public Sector Economy <i>Veronika Faifrová</i>	KZ	2	2P+0C	Z	PV
20Y1EK	Qualification in Electrical Engineering	KZ	2	2P+0C	L	PV
16Y1EN	Energy Requirements of Vehicles	KZ	2	2P+0C	L	PV

20Y1EA	Environmental Aspects of Transport	KZ	2	2P+0C	Z	PV
15Y1EH	European Integration within Historical Context <i>Jan Feit</i>	KZ	2	2P+0C	Z	PV
18Y1EM	Experimental Methods in Mechanics <i>Daniel Kytý</i>	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	KZ	2	2P+0C	L	PV
14Y1HW	Computer Hardware	KZ	2	2P+0C	L	PV
15Y1HL	History of Civil Aviation <i>Eva Rezlerová, Vladimír Plos</i>	KZ	2	2P+0C	L,Z	PV
15Y1HD	History of City Mass Transport <i>Milan Dont, Eva Rezlerová</i>	KZ	2	2P+0C	Z	PV
12Y1HD	Traffic Noise <i>Dagmar Ko árková, Libor Ládyš</i>	KZ	2	2P+0C	L	PV
15Y1HE	Work Hygiene and Ergonomics in Traffic <i>Eva Rezlerová, Petr Musil</i>	KZ	2	2P+0C	Z	PV
16Y1IS	Interactive simulators and simulations	KZ	2	2P+0C	L	PV
12Y1KN	Combined Transportation <i>Petr Nejedlý</i>	KZ	2	2P+0C	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 <i>Petra Skolilová Petra Skolilová (Gar.)</i>	KZ	2	2P+0C	L	PV
20Y1LN	Location and Navigation	KZ	2	2P+0C	L	PV
21Y1MZ	Managerial Ethics	KZ	2	2+0	Z	PV
17Y1MD	Marketing in Transportation	KZ	2	2P+0C	Z	PV
11Y1MM	Mathematical Models in Economy	KZ	2	2P+0C	Z	PV
18Y1MT	Engineering Materials <i>Jaroslav Valach</i>	KZ	2	2P+0C	L	PV
14Y1MP	Modeling Complex Assemblies and Models in Parametric Modeller	KZ	2	2P+0C	Z	PV
17Y1ND	Maritime Transportation	KZ	2	2+0	Z	PV
15Y1NE	German in the Economy and Society	KZ	2	2P+0C	Z	PV
21Y1OL	Security of Air Transport	KZ	2	2+0	L	PV
23Y1OK	Protection of Critical Objects and Infrastructures	KZ	2	2P+0C	L	PV
20Y1OI	Fare Collection and Information Systems <i>Patrik Horaž ovský, Milan Sliacky Milan Sliacky (Gar.)</i>	KZ	2	2P+0C	L	PV
14Y1OP	Operating System	KZ	2	2P+0C	Z	PV
17Y1OF	Personal Finance	KZ	2	2P+0C	Z	PV
11Y1PV	Parametrical and Multicriterial Programming <i>Olga Vraštilová</i>	KZ	2	2P+0C	Z	PV
17Y1PM	Personnel Management	KZ	2	2P+0C	L	PV
12Y1PC	Pedestrian and Cycling Transport <i>Denis Liutov</i>	KZ	2	2P+0C	L	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 <i>Petr Zlámál</i>	KZ	2	2P+0C	L	PV
14Y1PI	Corporate Information System	KZ	2	2P+0C	Z	PV
14Y1PZ	Advanced Data Processing in Spreadsheets	KZ	2	2P+0C	Z	PV
12Y1PD	Assessment of Transport Structures	KZ	2	2P+0C	Z	PV
20Y1PK	Product Quality Management Processes <i>Martin Leso</i>	KZ	2	2P+0C	Z	PV
14Y1PJ	C Programming Language	KZ	2	2P+0C	Z	PV
12Y1C1	Designing Roads in Civil 3D I <i>Tomáš Honc</i>	KZ	2	2P+0C	L	PV
12Y1C2	Designing Roads in Civil 3D II <i>Tomáš Honc</i>	KZ	2	2P+0C	Z	PV
14Y1PA	3D Modeling in AutoCAD	KZ	2	2P+0C	Z	PV
16Y1PV	Operation, Construction and Maintenance of Vehicles	KZ	2	2P+0C	L	PV
12Y1PU	Organization Disposition of Railway Stations	KZ	2	2P+0C	L	PV
16Y1RE	Control and Electronic Vehicle Systems <i>Josef Mík, P emysl Toman</i>	KZ	2	2P+0C	Z	PV

21Y1RZ	Human Resources Management	KZ	2	2P+0C	L	PV
17Y1ST	Titan Simulation	KZ	2	2P+0C	L	PV
20Y1SC	Sensors and Actuators	KZ	2	2P+0C	L	PV
11Y1SI	Transportation Software Engineering <i>Martin P ní ka</i>	KZ	2	2P+0C	Z	PV
22Y1SZ	Forensic Expertise	KZ	2	2P+0C	L	PV
16Y1KS	Quality and Reliability of Vehicles <i>Jaroslav Machan, David Lehet</i>	KZ	2	2P+0C	Z	PV
12Y1SU	Road Management and Maintenance <i>Dagmar Ko árková, Otakar Vacín</i>	KZ	2	2P+0C	L	PV
21Y1TH	Aircraft Technical Handling <i>Peter Olexa</i>	KZ	2	2P+0C	Z	PV
11Y1TG	Graph Theory <i>Lucie Kárná Lucie Kárná Lucie Kárná (Gar.)</i>	KZ	2	2P+0C	L	PV
14Y1TI	Creating Interactive Internet Applications	KZ	2	2P+0C	L	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 <i>Jitka ezní ková, Josef Kolá</i>	KZ	2	2P+0C	L	PV
12Y1VC	Waterways and Shipping	KZ	2	2P+0C	Z	PV
23Y1VS	Negotiation and Cooperation <i>Milena Macková</i>	KZ	2	2P+0C	Z	PV
14Y1VM	Development of Applications for Mobile Devices	KZ	2	2P+0C	Z	PV
16Y1VT	Development in Railroad Vehicles	KZ	2	2P+0C	L	PV
14Y1W1	Webdesign 1	KZ	2	2P+0C	Z	PV
14Y1W2	Webdesign 2	KZ	2	2P+0C	L	PV
16Y1ZG	Introduction into Applied Computer Graphics	KZ	2	2P+0C	L	PV
21Y1ZA	Basics of Aerobatics	KZ	2	2+0	L	PV
14Y1ZM	Fundamentals of parametric and adaptive modeling	KZ	2	2P+0C	L	PV
11Y1ZM	Foundation of MATLAB Programming <i>Sárka Vorá ová Sárka Vorá ová Sárka Vorá ová (Gar.)</i>	KZ	2	2P+0C	L	PV
12Y1ZU	Principles of Urbanism <i>Karel Hájek</i>	KZ	2	2P+0C	Z	PV
16Y1ZL	Vehicle Testing, Legislation and Construction <i>Zuzana Radová, Josef Mík</i>	KZ	2	2P+0C	Z	PV

Characteristics of the courses of this group of Study Plan: Code=Y1-BLOG 16/17 Name=PVP bak.prez.LOG 16/17

17Y1AF	Alternative Forms of Transportation Project Financing	KZ	2
There will be specified such forms of financing in transportation, where the public sector body perform the final debtor, i. e. debtor payments come from its budget, but the final debtor is not a direct participant of the transaction and it is not the counterparty of the financial institute which provides the funding. Issue of securities as an alternative source of transportation project.			
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
Advanced modifications and modeling of NURBS, Patch objects, selection of objects (according to filter and properties). 3D Studio MAX systems and Space Warp objects. Atmospheric and other effects, rendering filters, Motion blur, advanced animations, Motion panel. Modeling for morphing and animation, bone formation, animation using Inverse Kinematics.			
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.			
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.			
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.			

15Y1DU	History of Art and Society	KZ	2
History of art - definitions, terminology, division into periods. Architecture, fine arts, design. Situation in Central Europe, today in the Czech Republic. Stations, bridges, industrial buildings. Design of transport vehicles.			
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.			
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.			
17Y1EV	Public Sector Economy	KZ	2
Economic and financial theory of public sector, public choice theory, externalities, decisions about public finance allocation, economic assessment of public projects (CBA, MCA, CEA), tax system of the CR, state budget, management of public projects and their economic efficiency assessment, way of elaboration of PPP projects, funding from EU funds, program HDM-4.			
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 gases, 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, nazism, 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
Computer architecture, basics of logical circuits design and their realization using FPGA. In detail, description of computer architecture and separate parts designing - controllers, arithmetic and logical units, I/O subsystem.			
15Y1HL	History of Civil Aviation	KZ	2
Beginnings of flying, development of aircrafts lighter than air. Beginnings of aircrafts heavier than air. Czechoslovak aviation pioneers. Development of airports in the Czech Republic. World airports. Famous aviators. Helicopters. CSA airplanes. Development of aircrafts in Czechoslovakia between the years 1945-1989. Classic era of aviation. Golden era of civil aviation. Modern era of civil aviation. Airline companies. Supersonic flying.			
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, standards, 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 simulators and simulations	KZ	2
Simulation theory and application of computing equipment. Creating computing models. Mechanical and dynamic systems and their mathematical models. Computing methods. Simulation of vehicle dynamics, on-land carriage in particular. Virtual reality systems. Practical exercise with simulation software and interactive simulators.			
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 outcome 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.			
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.			
17Y1ND	Maritime Transportation	KZ	2
History and importance of the maritime transportation, theoretical discipline in maritime transportation, seafaring vessels, maritime ports and their utilization, inland logistic centre and maritime ports, transport corridors and link by maritime, river and rail transport I and II, global maritime corridors, logistics of maritime transportation, maritime transportation and smart containers, ITS in maritime transport.			
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.			
21Y1OL	Security of Air Transport	KZ	2
The development of civil aviation. Definitions and regulations. History of acts of unlawful interference. Terrorism in aviation. National security program. Crisis management. Protection at airports - operational procedures. Modern means of protection and control.			
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 processes. 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 coefficients 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.			
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.			
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 communication projecting (clotoidic transition curve, cross-and longitudinal section). Basics of 3D modelling.			
18Y1PS	Computer Simulations in Mechanics	KZ	2
Principles and overview of tools 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.			
14Y1PI	Corporate Information System	KZ	2
Data-information-knowledge, components of information system, syntactic 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.			
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, pointers, dynamical memory allocation, string, files, structures and unions. Implementations of abstract data types (FIFO, LIFO, list), programming techniques (sorting, searching, recursion), using bitwise operators.			
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. Maintenance 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.			
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 protocols 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.			
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.			
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 usage.			
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 Assembly, Manufacturing, 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-icing and anti-icing units. Loading and unloading units. Equipment for passengers onboarding and offboarding. Operational processes of aircraft technical handling and regulations. Modernization and technical progress.			
11Y1TG	Graph Theory	KZ	2
Basic concepts and terminology of graph theory, graph representation. Problems of graph theory, problem instance. Graph search algorithms, trees, minimum spanning tree, shortest path problem, Eulerian path, bipartite graph matching, flow networks, circulations, critical path method, traveling salesman problem. Problem of existence and optimization and algorithms for their solving. Computational complexity, dealing with NP-complete 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.			
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.			
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 parameters 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.			
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.			
21Y1ZA	Basics of Aerobatics	KZ	2
The history, development and aerobatics in present, aerodynamics and mechanics of flight during marginal flight modes, piloting technique of individual elements, competition aerobatics, aerobatics programs, preparation for practicing aerobatics and safety training, competitive psychology and concentration on performance.			
14Y1ZM	Fundamentals of parametric and adaptive modeling	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). Spatial arrangement of settlements. Types of towns or cities with a certain prevailing function, forms of their development. Brief overview of land-use planning.			
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.			

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 (pro B3710)

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

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

Credits in the group: 6

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
15JZ3F	Foreign Language - French 3 <i>Eva Rezlerová, Irena Veselková</i>	Z	3	0P+4C+10B	Z	J
15JZ3I	Foreign Language - Italian 3 <i>Eva Rezlerová, Irena Veselková</i>	Z	3	0P+4C+10B	Z	J
15JZ3N	Foreign Language - German 3 <i>Eva Rezlerová, Martina Navrátilová, Jana Štikarová</i>	Z	3	0P+4C+10B	Z	J

15JZ3R	Foreign Language - Russian 3 <i>Marie Michlová, Eva Rezlerová</i>	Z	3	0P+4C+10B	Z	J
15JZ3S	Foreign Language - Spanish 3 <i>Eva Rezlerová, Nina Hricsina Puškinová</i>	Z	3	0P+4C+10B	Z	J
15JZ4F	Foreign Language - French 4 <i>Eva Rezlerová, Irena Veselková</i>	Z,ZK	3	0P+4C+10B	L	J
15JZ4I	Foreign Language - Italian 4 <i>Eva Rezlerová</i>	Z,ZK	3	0P+4C+10B	L	J
15JZ4N	Foreign Language - German 4 <i>Eva Rezlerová, Martina Navrátilová, Jana Štikarová</i>	Z,ZK	3	0P+4C+10B	L	J
15JZ4R	Foreign Language - Russian 4 <i>Marie Michlová, Eva Rezlerová</i>	Z,ZK	3	0P+4C+10B	L	J
15JZ4S	Foreign Language - Spanish 4 <i>Eva Rezlerová, Nina Hricsina Puškinová</i>	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 (pro B3710)

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 Eukclidean space and Cartesian coordinate system. Geometric meaning of the differential of functions several real variables, differential calculus of functions of several real variables.			
11CAL2	Calculus 2	Z,ZK	5
Indefinite integral, Newtonian integral, Riemannian integral of the function of one variable, improper Riemannian integral, Riemannian integral in Rn. Parametric description of regular k-dimensional surfaces in Rn, Riemannian integral over regular surfaces. Line and surface integrals of the second type, Stokes theorems, ordinary differential equations of the first order, linear differential equations with constant coefficients and its systems			

11FY1	Physics 1 Kinematics, particle dynamics, dynamics of particle systems and rigid body. Continuum mechanics, thermodynamics, electric field, directed electric current.	Z,ZK	4
11FY2	Physics 2 Magnetic field, electromagnetic field. Optics, quantum character of electromagnetic radiation. Introduction into quantization, hydrogen atom. Multi-electron atoms, the nuclei. Basics of solid body physics.	Z,ZK	4
11GIE	Geometry Differential geometry of curves - parameterization, the arc of the curve, torsion and curvature, Frenet's trihedron. Kinematics - a curve as a trajectory of the motion, the velocity, and acceleration of a particle moving on a curved path.	KZ	3
11LA	Linear Algebra Vector spaces (linear combinations, linear independence, dimension, basis, coordinates). Matrices and operations. Systems of linear equations and their solvability. Determinants and their applications. Scalar product. Similarity of matrices (eigenvalues and eigenvectors). Quadratic forms and their classification.	Z,ZK	3
11LP	Linear Programming Formulation of the problem of linear programming, transcription of some practical problems to the linear programming problems. Simplex and convex polyedra. Simplex method, basic solutions, duality principle in linear programming, stability of solution of linear programming problem. Traffic problem.	KZ	3
11MSP	Modeling of Systems and Processes System and subsystem, external and internal system description, continuous and discrete system, mathematics as a tool, examples of formulation of differential and differential equations. Linear and nonlinear system, stationary and non-stationary system, causality. Convolutional integral. Laplace and Z transformations. Transfer function. Stability of LTI systems. Discretization of continuous systems. System interconnection.	Z,ZK	4
11STAS	Statistics Definition of probability, random variable and its description, known distributions, random vector, function of random variable. Methods of point estimation. Testing of statistical hypothesis. Regression and correlation, linear regression, correlation coefficient, coefficient of determination, the general linear model, statistical inference in linear regression, analysis of variance, multiple regression, the use of matrices in regression.	Z,ZK	5
11X31	Project 1	Z	2
11X32	Project 2	Z	2
11X33	Project 3	Z	2
11Y1MM	Mathematical Models in Economy 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 outcome of the course is the ability to implement and solve basic tasks from the queue theory, graph theory and both free and constrained optimization.	KZ	2
11Y1PV	Parametrical and Multicriterial Programming Solution to the problem of linear programming with a parameter in objective function, on right sides and in the matrix of coefficients of linear constraints. Computation of efficient solution.	KZ	2
11Y1SI	Transportation Software Engineering Basic concepts of software engineering, ranging from domain analysis, requirement analysis and software architectures to analyses, design and implementation using formal techniques and practical usage.	KZ	2
11Y1TG	Graph Theory Basic concepts and terminology of graph theory, graph representation. Problems of graph theory, problem instance. Graph search algorithms, trees, minimum spanning tree, shortest path problem, Eulerian path, bipartite graph matching, flow networks, circulations, critical path method, traveling salesman problem. Problem of existence and optimization and algorithms for their solving. Computational complexity, dealing with NP-complete problems, heuristic approach.	KZ	2
11Y1ZM	Foundation of MATLAB Programming 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.	KZ	2
12MDE	Transport Models and Transport Excesses 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.	Z,ZK	3
12PPOK	Designing Roads, Highways and Motorways Definition, types, ownership, maintenance, management and categorization of roads and highways. Curve and transition curve. Sinuosity and standard speed. Route in rural areas. Range of vision for stopping and overtaking. Road body - shapes and proportions, bottom and superstructure. Drainage and components of roads. Safety device. Crossings, junctions, intersections.	KZ	3
12X31	Project 1	Z	2
12X32	Project 2	Z	2
12X33	Project 3	Z	2
12Y1C1	Designing Roads in Civil 3D I 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.	KZ	2
12Y1C2	Designing Roads in Civil 3D II 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.	KZ	2
12Y1DS	Project Documentation in Practice 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.	KZ	2
12Y1HD	Traffic Noise Acoustic introduction, basic terms, quantities. Basics of physiological acoustic, noise impacts on human body. Acoustic legislation, standards, 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.	KZ	2
12Y1KN	Combined Transportation Combined transport strategy and legislation. Load units. Means of transport in combined transport. Combined transport systems. Transshipping areas. Multimodal logistic centres.	KZ	2

12Y1PC	Pedestrian and Cycling Transport 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.	KZ	2
12Y1PD	Assessment of Transport Structures 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.	KZ	2
12Y1PU	Organization Disposition of Railway Stations 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.	KZ	2
12Y1SU	Road Management and Maintenance 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.	KZ	2
12Y1VC	Waterways and Shipping 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.	KZ	2
12Y1ZU	Principles of Urbanism Survey on history of city and settlement building. Functional components and their mutual relations (working, living, recreation, transportation). Spatial arrangement of settlements. Types of towns or cities with a certain prevailing function, forms of their development. Brief overview of land-use planning.	KZ	2
12ZTS	Railway Lines and Stations 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.	Z,ZK	4
12ZYDI	Introduction to Transportation Engineering 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.	Z,ZK	2
14AS	Algorithm and Data Structures 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.	KZ	2
14AZ	Data Analysis and Processing Main aim of this course is learn students how to prepare raw data for following processing and analysis. Knowledge of algorithms for determining the parameters of different data sources; source can be used images, text, time series, etc. The next step is the theoretical skills and knowledge to apply in solving the problem, e. g. extraction parameters from the image data or from the Internet.	KZ	2
14DB	Database Systems 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.	KZ	2
14DMG	Datamining Types of data sources and knowledge, data warehouses and OLAP technology for data mining, data preprocessing in the process of knowledge acquisition systems for data mining, mining characteristics of concepts (classes), mining association rules from relational db. and data warehousing, classification (decisions tree, Bayesian cob., using neural networks). Prediction. Cluster analysis. Mining in complex structured data, multimedia dbf., www.	KZ	2
14KSP	Constructing with Computer Aid "CAD systems" term determination. CAD role in projecting system model. Existing CAD systems on Czech market. Project creation, basic common work rules in graphic applications and CA systems. Co-ordinated systems, CAD environment skill (basics of constructing, dimensioning, modifications, user interfaces, projecting possibilities, AutoCAD environment profiles, drawings with raster foundations).	KZ	2
14MPG	Modern Programming Approaches Principles of object oriented programming, polymorphism, references, memory allocation, inheritance, generic programming, operator overloading, STL library, object implementation of abstract data types, graph and graph algorithm implementation focused on logistic problems.	KZ	2
14PRG	Programming The Course Programming builds on and fully extends the course 14ASD (Algorithmization and Data Structures). The knowledge of the Python programming language is expanded here so that the participant gains skills and can apply them to solve various follow-up tasks. Main topics: lists, multidimensional arrays, sorting and searching, tuples, sets, dictionaries, working with date and time, regular expressions, functions and procedures, working with files (CSV, JSON, XML).	KZ	2
14X31	Project 1	Z	2
14X32	Project 2	Z	2
14X33	Project 3	Z	2
14Y1AV	Animation and Visualization Advanced modifications and modeling of NURBS, Patch objects, selection of objects (according to filter and properties). 3D Studio MAX systems and Space Warp objects. Atmospheric and other effects, rendering filters, Motion blur, advanced animations, Motion panel. Modeling for morphing and animation, bone formation, animation using Inverse Kinematics.	KZ	2
14Y1BE	Barrierless Transport 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.	KZ	2
14Y1BM	Biometric Methods 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.	KZ	2
14Y1HW	Computer Hardware Computer architecture, basics of logical circuits design and their realization using FPGA. In detail, description of computer architecture and separate parts designing - controllers, arithmetic and logical units, I/O subsystem.	KZ	2

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 processes. 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 communication 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, syntactic 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, pointers, dynamical memory allocation, string, files, structures and unions. Implementations of abstract data types (FIFO, LIFO, list), programming techniques (sorting, searching, recursion), using bitwise operators.			
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 modeling	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.			
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.			
15Y1DU	History of Art and Society	KZ	2
History of art - definitions, terminology, division into periods. Architecture, fine arts, design. Situation in Central Europe, today in the Czech Republic. Stations, bridges, industrial buildings. Design of transport vehicles.			
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, nazism, 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 Civil Aviation	KZ	2
Beginnings of flying, development of aircrafts lighter than air. Beginnings of aircrafts heavier than air. Czechoslovak aviation pioneers. Development of airports in the Czech Republic. World airports. Famous aviators. Helicopters. CSA airplanes. Development of aircrafts in Czechoslovakia between the years 1945-1989. Classic era of aviation. Golden era of civil aviation. Modern era of civil aviation. Airline companies. Supersonic flying.			
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.			
16DPO	Vehicle Technology	KZ	2
Vehicle. Functions, principles. Drive, vehicle construction. Road transport, safety, heavy duty vehicle desing, dynamics. Rail transport, safety, carriage design. Drive. Electric traction. Transshipment. Technological components of various modes of transport. Management and control of various means of transport. Safety.			
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 simulators and simulations Simulation theory and application of computing equipment. Creating computing models. Mechanical and dynamic systems and their mathematical models. Computing methods. Simulation of vehicle dynamics, on-land carriage in particular. Virtual reality systems. Practical exercise with simulation software and interactive simulators.	KZ	2
16Y1KS	Quality and Reliability of Vehicles 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 Assembly, Manufacturing, Quality, Services ...) and other methods used in industrial applications. Knowledge-based systems of quality and reliability, data collection.	KZ	2
16Y1PV	Operation, Construction and Maintenance of Vehicles Methods of vehicle production. Vehicle maintenance. Vehicle diagnostics. Maintenance and repair plans. Engine maintenance and emission measurement. Transmission mechanism. General principles of engine diagnostics.	KZ	2
16Y1RE	Control and Electronic Vehicle Systems 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 protocols etc.). Vehicle electronic control, safety, communication and comfort systems.	KZ	2
16Y1VT	Development in Railroad Vehicles Railroad vehicles traction. Railroad vehicle parameters regulation. Control and driving of railroad vehicles. Importance in heavy duty and personal transportation. Critical situation assessment. New materials in design. International standardization.	KZ	2
16Y1ZG	Introduction into Applied Computer Graphics 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, techniques, graphics and visualisation HW basics. Introduction to 2D and 3D graphics software.	KZ	2
16Y1ZL	Vehicle Testing, Legislation and Construction Vehicle, bus and motorbike construction, 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.	KZ	2
17EDPO	Economics of Transport Company Economy, marginal utility, marginal costs, function of supply and demand, market equilibrium, perfect competition and types of market arrangement. Transportation market, transport company, its environment, balance sheet, costs, revenue, profit and maximization of profit. Financial management in transport, business plan, taxation in transport.	Z,ZK	5
17EMY	Management Science The introduction to economical-mathematical models before its application in concrete technical and economical cases. The basic mathematical methods to modelise economical situations. Several classes of problems are formulated and different methods used in qualitatively distinct real situations are introduced. The tasks of interpretation and application.	Z	2
17FEU	Public Administration and Financing in Transport To get a basic overview of the EU regional policy and its practical execution on the level of the member state, specific ability to find and analyze information about the EU support programmes.	Z,ZK	4
17GEDS	Geography of Transport Systems Regional differentiation of the transport system. Sociogeographic regionalization and its relation to transport. Transport and local and regional development. Spatial interaction - theoretical and methodological framework. Mobility research - travel behavior, mode choice and the influence onto "modal-split." Modal competition. Practical use of transport-geographical analysis in transportation planning.	KZ	2
17IVD	Integration of Public Transport Transport policy, planning, contracts, funding, clearing of traffic receipts, tariff systems, traffic and carriage controls, legal conditions within public transport.	ZK	4
17LGT	Logistics Logistics definition, basic concepts, store, warehouse, transport and handling equipment, logistics technology, logistics centers, information and intelligent logistics systems, logistics city.	Z,ZK	6
17MAS	Small and Medium Enterprise Small and medium enterprise - plans, market, analysis, finance, management, decision making, survival, growth.	Z,ZK	3
17MEKA	Methods of Economics Analysis The techniques of economical analysis in the domain of analysis of dependencies, analysis and construction of time series and comparison of statistical values using differences and indices.	KZ	2
17MRZ	Managerial Decision Making The course is divided into two main sections. The first section deals with individual-level processes that influence managers' decisions. The second section considers collective (that is, group or organizational) forces that affect managers' decisions.	Z	2
17PAZ	Carriage and Forwarding Contracts of carriage and forwarding, waybills and documents; transport modes, multimodal transport, tariffs and prices in transport, rights and obligations of carriers, hauliers and forwarders, duty and tariff agreements, INCOTERMS, insurance in transport.	Z	2
17RAC	Rationalization and Quality of Transport Transport system, transportation funding, cost calculation, efficiency, transport rationalization, quality management, standards and quality standardization, quality management systems, quality management in transport and logistics, marketing and transport quality, quality costs, quality measurement and monitoring, statistics in quality management, improving, focus on the customer.	Z,ZK	7
17RPT	Project Management Basic terms of the project management, project management standards, organizational structures in the project management, projects in transport and transport infrastructure and their specifics, feasibility study and CBA, project evaluation, PPP projects.	Z,ZK	5
17SFID	Public Administration and Financing in Transport Basic issues of transport and transport policy in the social context, environmental issues in transport, economical aspects of transport, public administration and financing of transport.	Z,ZK	4
17TEDL	Transport Technology and Logistics Basic terms in transport technology and logistics, particular steps of transport planning, line planning, timetabling, planning in passenger and freight transport, organisation of traffic in each transport modus, technologic factors of the side of operator and client, organisation of city transport, logistic technologies and their application using various transport modus.	KZ	3
17TGA	Graph Theory and its Applications in Transport 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.	Z,ZK	4
17TVD	Technology of Public Transport The course contents a detailed description of new knowledge and basic principles of hierarchical planning of public transport system accenting the general transport planning and quantified transport demand. The course would be oriented on multiple and multi-level optimisation of passenger public transport system.	Z,ZK	5
17X31	Project 1	Z	2

17X32	Project 2	Z	2
17X33	Project 3	Z	2
17Y1AF	Alternative Forms of Transportation Project Financing	KZ	2
There will be specified such forms of financing in transportation, where the public sector body perform the final debtor, i. e. debtor payments come from its budget, but the final debtor is not a direct participant of the transaction and it is not the counterparty of the financial institute which provides the funding. Issue of securities as an alternative source of transportation project.			
17Y1EV	Public Sector Economy	KZ	2
Economic and financial theory of public sector, public choice theory, externalities, decisions about public finance allocation, economic assessment of public projects (CBA, MCA, CEA), tax system of the CR, state budget, management of public projects a their economic efficiency assessment, way of elaboration of PPP projects, funding from EU funds, program HDM-4.			
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.			
17Y1ND	Maritime Transportation	KZ	2
History and importance of the maritime transportation, theoretical discipline in maritime transportation, seafaring vessels, maritime ports and their utilization, inland logistic centre and maritime ports, transport corridors and link by maritime, river and rail transport I and II, global maritime corridors, logistics of maritime transportation, maritime transportation and smart containers, ITS in maritime transport.			
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.			
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 in bending of beam. Design and analysis of cross section of beam. Design of riveted, bolted and welded joints of structures. Analysis of deflection curve of beams. Torsion of circular cross sections. Combined loading. Stability.			
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 tools 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).			
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.			
21X31	Project 1	Z	2
21X32	Project 2	Z	2
21X33	Project 3	Z	2
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.			
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.			
21Y1OL	Security of Air Transport	KZ	2
The development of civil aviation. Definitions and regulations. History of acts of unlawful interference. Terrorism in aviation. National security program. Crisis management. Protection at airports - operational procedures. Modern means of protection and control.			
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-icing and anti-icing units. Loading and unloading units. Equipment for passengers onboarding and offboarding. Operational processes of aircraft technical handling and regulations. Modernization and technical progress.			
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.			
21Y1ZA	Basics of Aerobatics	KZ	2
The history, development and aerobatics in present, aerodynamics and mechanics of flight during marginal flight modes, piloting technique of individual elements, competition aerobatics, aerobatics programs, preparation for practicing aerobatics and safety training, competitive psychology and concentration on performance.			
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.			
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.			
23BDIS	Safety Technologies of Transportation and Information Systems	KZ	3
Safety of transportation means - principles, testing, evaluation. Safety of infrastructures, critical structures, crisis scenarios. Safety of information systems and their robustness.			
23DPSP	Traffic Law and Related Regulations	Z	1
Analysis of selected laws in transportation domain (e. g. Road Act, Road Transport Act, Civil Aviation Act, Railways Act, Inland Navigation Act), selected EU transport legislation.			
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.			
23ZAP	Basics of Law	Z	2
Basic orientation in the Czech legal system. The course is primarily intended to provide students with orientation in fundamentals of the Czech Republic, legal system and in various forms of law, including adoption of the basic principles of European Community law. The course consists of selected chapters from the public and private law and European Community law.			
TV-1	Physical Education	Z	1
TV-2	Physical Education	Z	1

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

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