

Study plan

Name of study plan: MED bak.prez.13/14

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: 156

The role of the block: Z

Code of the group: 1.S.BP 10/11

Name of the group: 1.sem.bak.prez.10/11

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 12 courses

Credits in the group: 30

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
13E	Economics	Z,ZK	3	2+1	Z	z
11GIE	Geometry Šárka Vorá ová, Old ich Hykš, Pavel Provinský Šárka Vorá ová	KZ	3	2P+2C+12B	Z	z
14KSP	Constructing with Computer Aid Ji í Brož, Ji í Brož, Martin Brumovský, Vladimír Doua, Radek Kratochvil, Michal Mlada, Lukáš Svoboda, Martin Šrotý, Jan Vogl, Lukáš Svoboda	KZ	2	0P+2C+8B	Z	z
11LA	Linear Algebra Pavel Provinský, Lucie Kárná, Martina Be vá ová Martina Be vá ová	Z,ZK	3	2P+1C+10B	Z	z
11MTA	Mathematical Analysis	Z,ZK	4	2+2	Z	z
18MRI1	Materials 1	Z,ZK	3	2+1	Z	z
00TVC1	Physical Education 1	Z	1	0+2	Z	z
18TTED	Creation of Technical Documentation	KZ	2	2+1	Z	z
22UN	Traffic Accidents Introduction	Z	2	2+0	Z	z
12ZADI	Introduction to Transportation Engineering	Z,ZK	3	2+1	Z	z
14ZINF	Fundamentals of Informatics	KZ	2	0+2	Z	z
21ZLD	Introduction to Air Transport	KZ	2	2+1	Z	z

Characteristics of the courses of this group of Study Plan: Code=1.S.BP 10/11 Name=1.sem.bak.prez.10/11

13E	Economics	Z,ZK	3	Microeconomic and macroeconomic interpretation of economic relations. Method and subject of the economics. Economic decision making of consumers and producers. Market structures. Labour and capital, efficiency, ownership, public choice.
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.
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).
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.

11MTA	Mathematical Analysis	Z,ZK	4
Sequences and series of real numbers and its convergence. Basic properties of functions. Differential and integral calculus of the real function of one real variable. Power series, Fourier series and foundations of Fourier transform.			
18MRI1	Materials 1	Z,ZK	3
Crystal structure. Basics of thermodynamics of metals and their alloys. Balanced binary diagrams. Alloys of iron with carbon. Deterioration of solid solutions. Heating processing of steel and cast irons. Physical features. Mechanical features. Dephctostopic testing. Corosion.			
00TVC1	Physical Education 1	Z	1
Practical instruction and training in a wide variety of sports and games: from basic recreational coaching to competitive top level training. Included are: basketball, volleyball, soccer, tennis, squash, floorball, bodybuilding, swimming, canoeing, aerobic.			
18TTED	Creation of Technical Documentation	KZ	2
Technical standards, international standardization, types of technical drawings, representation of technical objects, technical diagrams and charts, dimensional and geometrical accuracy, arrangement of drawing sheets, types of schemes and their creation.			
22UN	Traffic Accidents Introduction	Z	2
Traffic accident as a physical process, systematic submission, vehicle x human x infrastructure interaction, accidents statistics, aircraft accidents, accidents on railways, accidents on waterways, road traffic accidents, other aspects, accidental prevention.			
12ZADI	Introduction to Transportation Engineering	Z,ZK	3
Traffic survey. Terrestrial roads. Residential zone. Land - use planning. Railway transport. Public mass transport. Integrated traffic systems. Traffic prognosis. Traffic safety. Air transport. Traffic and environment.			
14ZINF	Fundamentals of Informatics	KZ	2
Introduction to faculty network, MS-Word and Open Office, use of styles and advanced features, computer functions and information transmission. Number systems incl. arithmetic calculations. Algorithms and their proprieties. Flow charts for algorithms drawing. Mathematic and logic ordering algorithms incl. functions and procedures. Work with MS-Excel - tables, graphs, calculations, functions.			
21ZLD	Introduction to Air Transport	KZ	2
Air transport as a component of complex transport system. International status of civil aviation. International organizations in Europe and worldwide. Characteristics of air transport. Commercial air transport. Technical operations of aeroplanes.			

Code of the group: 2.S.BP 10/11

Name of the group: 2.sem.bak.prez.10/11

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 12 courses

Credits in the group: 30

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
13EDOT	Economy, Transport, Telecommunications	KZ	2	2+0	L	z
11FY1	Physics 1	Z,ZK	4	2P+2C	L	z
11MVP	Mathematical Analysis of Function of More Variables	Z,ZK	3	2+2	L	z
18MRI2	Materials 2	KZ	2	2+0	L	z
11PT	Probability Ivan Nagy	Z	2	1+1	L	z
12PKD	Rail Transport Designing	Z,ZK	3	2+2	L	z
14SIAP	Networks and Protocols	KZ	2	1+1	L	z
18ST	Statics	Z,ZK	3	2+1	L	z
17TDL	Transport Technology and Logistics	Z,ZK	3	2+2	L	z
00TVC2	Physical Education 2	Z	1	0+2	L	z
20UIS	Introduction to ITS	Z,ZK	3	2+1	L	z
14UPRO	Introduction to Programming	KZ	2	0+2	L	z

Characteristics of the courses of this group of Study Plan: Code=2.S.BP 10/11 Name=2.sem.bak.prez.10/11

13EDOT	Economy, Transport, Telecommunications	KZ	2
Transport, telecommunications, demand, supply, indicators, economic development, legislation, European union, regulation, liberalisation, transport modes, ITS, sustainability.			
11FY1	Physics 1	Z,ZK	4
Kinematics, particle dynamics, dynamics of particle systems and rigid body. Continuum mechanics, thermodynamics, electric field, directed electric current.			
11MVP	Mathematical Analysis of Function of More Variables	Z,ZK	3
Metric spaces, sequences in metric spaces, limit of sequence in metric space. Differential calculus of functions of several variables, differential of function, partial derivations, implicitly defined functions, extremes of functions of several variables. Integral calculus of functions of several variables, Riemann integral, integral over curves and surfaces in R3, application of integral calculus in physics.			
18MRI2	Materials 2	KZ	2
Fundamental concepts, notions. The main materials groups. Semiconductors. Polymers. Special types of steel. Properties and application of the composite materials.			
11PT	Probability	Z	2
Descriptive statistics. Basic probability concepts: elementary events and events, definitions and interpretation of probability. Random variable, probability distribution, probability mass and density, moments, some discrete and continuous distributions. Random vectors: joint and marginal distributions, mean vector, covariance matrix. Mixed distributions, mixture of distributions. Law of large numbers, central limit theorem.			

12PKD	Rail Transport Designing	Z,ZK	3
Railway lines network. Vehicle and track relation. Traction. Track geometrical parameters. Clearance profile. Railway lines routing. Superstructure and substructure of the railway lines. Switches. Railway stations. City rail transport.			
14SIAP	Networks and Protocols	KZ	2
Basic communication model, history and development of the Internet, principle of data transfer through computer networks (TCP/IP), performance of basic network protocols (ARP, RARP, TCP, UDP, Telnet, FTP, DNS, DHCP POP3, IMAP), data acquisition from the Internet sources, communicating ability via the Internet and fundamentals of own web presentation design by the means of web sites.			
18ST	Statics	Z,ZK	3
General system of forces. Calculation of reactions of mass objects and compound systems. Assessment of internal forces on statically determinate beam and simple framework. Principle of virtual works. Kinematic method for calculation of reactions of statically determinate systems. Determination of axial forces in truss construction, method of joints and method of sections. Geometry of cross sections. Plane fiber polygons and catenary cables.			
17TDL	Transport Technology and Logistics	Z,ZK	3
Basic terms in transport technology and logistics. Particular steps of transport planning. Quantification of carriage relations. Line planning. Timetabling. Planning in passenger and freight transport. Organisation of traffic in each transport means. Technological factors from the point of view of operator and client. Organisation of public city transport. Logistic technologies and their application using various transport means.			
00TVC2	Physical Education 2	Z	1
Practical instruction and training in a wide variety of sports and games: from basic recreational coaching to competitive top level training. Included are: basketball, volleyball, soccer, tennis, squash, floorball, bodybuilding, swimming, canoeing, aerobic.			
20UIS	Introduction to ITS	Z,ZK	3
Intelligent Transport Systems (ITS), their objectives and vision. ITS in the world, in Europe and in the Czech Republic. Architecture of ITS and the role of standardization. Information and navigation systems. ITS in road, rail and combine transport. Design of ITS, organization, preparation and implementation of the project. Current projects in the Czech Republic.			
14UPRO	Introduction to Programming	KZ	2
Algorithm development, methods of structured programming, high-level programming languages, basics of C programming languages (types, variables, conditions, cycles, arrays, functions), programming techniques, complexity.			

Code of the group: 3.S.BP 11/12

Name of the group: 3.sem.bak.prez.11/12

Requirement credits in the group: In this group you have to gain 27 credits

Requirement courses in the group: In this group you have to complete 10 courses

Credits in the group: 27

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
11DAD	Differential and Difference Equations	Z,ZK	3	2+1	Z	z
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
12PPOK	Designing Roads, Highways and Motorways <i>Petr Šatra, Jiří Šarský, Jan Gallia, Tomáš Padělek, Petr Kumpošt</i>	KZ	3	1P+2C+10B	Z	z
18PZP	Elasticity and Strength <i>Petr Zlámal, Petr Koudeřka, Ján Kopačka, Jitka Šezníková, Tomáš Doktor, Radek Kolman, Jan Vyšehlí, Jan Šleichrt, Daniel Kytý,</i>	Z,ZK	3	2P+1C+10B	Z	z
11SIS	Statistics	Z,ZK	2	1+1	Z	z
20SSA	Systems Analysis	Z,ZK	3	2+1	Z	z
14UATT	Introduction to Automatization and Telecommunication Systems	KZ	2	3+0	Z	z
16UDDM	Introduction to Transportation and Manipulation Technics	ZK	2	2+0	Z	z
14ZAET	Fundamentals of Electrotechnics	KZ	2	2+1	Z	z

Characteristics of the courses of this group of Study Plan: Code=3.S.BP 11/12 Name=3.sem.bak.prez.11/12

11DAD	Differential and Difference Equations	Z,ZK	3
Difference equations and its systems. Some solvable types of differential equations of the first order. Linear differential equations of the n-th order. Methods for solution of the homogeneous equation, solution of inhomogeneous equation by means of variation of constants. Power series and their use for solution of differential equation. Boundary value problem. Eigennumbers and function for differential equation. Fourier series of function.			
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.			
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.			

18PZP	Elasticity and Strength	Z,ZK	3
Tension and compression. Bending of beam. Shear stress during bending of beam. Design and analysis of cross section of beam. Design of riveted, bolted and welded joint of structure. Analysis of deflection curve of beam. Torsion of circle cross section. Combined loading. Stability of compressed bar and buckling. Beam on elastic foundation. Strength analysis.			
11SIS	Statistics	Z,ZK	2
Point estimation, properties of point estimators, methods of point estimation. Testing statistical hypothesis. Fit test, independence test. Regression and correlation, linear regression, correlation coefficient, coefficient of determination, general linear model, statistical inference in linear regression, analysis of variance, multiple regression, use of matrices in regression.			
20SSA	Systems Analysis	Z,ZK	3
Systems identification. Typical tasks of systems analysis: on the interface, routes in system, decomposition and integration, on systems feedback. Capacity tasks, process analysis. Task about behaviour, aim behaviour, the genetic code, architecture and identity of systems. Fundamentals of technical cybernetics, stability and reliability of systems.			
14UATT	Introduction to Automatization and Telecommunication Systems	KZ	2
Basic axioms of technical cybernetics, automatization in transportation, human as the weakest element, signalling in transportation, modelling and projecting of transport systems, integrated technological and information system in port, principle of telecommunication signal transmission, solving of telecommunication networks, modulating methods, multimedia networks and services, NGN networks.			
16UDDM	Introduction to Transportation and Manipulation Technics	ZK	2
Means of transportation and transportation systems. Principles, functions and arrangement of means of transportation. Motors and their characteristics. Water transportation. Manipulating technics. Principles of lifting machines and conveyors. Legislation.			
14ZAET	Fundamentals of Electrotechnics	KZ	2
Basic electrotechnic terms, circuit quantities. Periodic courses characteristics. Electric circuits elements and basic circuit members. Assignating of bipoles and basic circuit elements. Solution to direct current circuits with a help of circuit analysis elementary methods: method of consecutive reduction, unloaded voltage divider, current divider. Transfiguration star-triangular and principle of superposition in direct current circuits.			

Code of the group: 4.S.BPMED 13/14

Name of the group: 4.sem.MED bak.prez. 13/14

Requirement credits in the group: In this group you have to gain 21 credits

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

Credits in the group: 21

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
17EM	Management Science	KZ	2	2+0	L	Z
17EDTP	Economy and Management of Transport and Telecommunication Processes	Z,ZK	3	2+1	L	Z
17GEDS	Geography of Transport Systems <i>Miroslav Marada, Milan Kříž</i>	KZ	2	2P+0C+8B	L	Z
17HG	Economic Geography	Z	2	2+0	L	Z
18KIAD	Kinematics and Dynamics	Z,ZK	2	2+1	L	Z
17MVD	Marketing in Transportation	Z,ZK	2	2+1	L	Z
17MEKA	Methods of Economics Analysis <i>Otto Pastor</i>	KZ	2	2P+0C	Z	Z
11MSP	Modeling of Systems and Processes <i>Lucie Kárná, Marek Honc, Bohumil Ková, Jan Píkrýl, Bohumil Ková (Gar.)</i>	Z,ZK	4	2P+2C+12B	L	Z
17RIP	Project Management	KZ	2	2+0	L	Z

Characteristics of the courses of this group of Study Plan: Code=4.S.BPMED 13/14 Name=4.sem.MED bak.prez. 13/14

17EM	Management Science	KZ	2
Linear Programming, graphical interpretation and solution of LP problem. Types of distribution problems, transportation problem. Models of network analysis. Models of queuing theory. Models of inventory management. Simulation models.			
17EDTP	Economy and Management of Transport and Telecommunication Processes	Z,ZK	3
Transport and telecommunication system, financing of transport infrastructure, transport policy, transport service, energy sources, public goods, externalities in transport and their treatment, assessment of public projects, CBA method, transport company, costing in transportation, transport quality.			
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.			
17HG	Economic Geography	Z	2
Introduction of the issues, definitions and introductory concepts. World geography and its research subject. Economic geography - Europe, Asia, Africa, Australia, America, the Czech Republic. Transport geography and its research subject. Characteristics of transportation as one of the branches of the global economy. Transport systems and their location in the world. Particular transport modes as part of the economy and the world transport system.			
18KIAD	Kinematics and Dynamics	Z,ZK	2
Motion along a line, motion along a curve. Kinematics of rigid plane, kinematics of rigid body. Point mass kinematics, system of point masses. Point mass dynamics and system of point masses, equation of motion. Method of Newton. Principle of D'Alembert. Free and forced vibration with one degree of freedom. Viscous damping. Impact theory. Introduction to the solution of vibration with multiple degrees of freedom.			
17MVD	Marketing in Transportation	Z,ZK	2
General principles of the marketing applied in transportation. Marketing, marketing research, macroworld, microworld, markets, market positioning, products, brands, package, service, pricing, distribution channels, physical distribution, retail, wholesale, promotion, advertising, segmentation, placement, action plan.			

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.			
11MSP	Modeling of Systems and Processes	Z,ZK	4
Mathematical methods and algorithms as a basis for system analysis. Methods for modelling and evaluating the systems in continuous and discrete time domain. Laplace transform, z-transform, and the recursive algorithms in solution of differential and difference equations, as an instrument for system description. Practical use of technical computing environment (MATLAB).			
17RIP	Project Management	KZ	2
Project, influences, pressures and influences. Entrepreneurial plan and capital decision making. Marketing, break-even point assessment. Project management and his characters. Organizational structures in project management. Feasibility study. Capital and operational costs assessment. Process of choosing optimal variant. Cost Benefit Analysis. Models of project financing. Life cycle of project. Financial anal. of capital projects. Project risks.			

Code of the group: 4.S.BPMED VÝB R 12/1

Name of the group: 4.sem.MED výb r p edm t 12/13

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) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
14EAT	Economic Analyses in Spreadsheets Programs Environment	KZ	2	0+2	L	z
14WS1	Webdesign With Web Standards 1	KZ	2	0+2	L	z

Characteristics of the courses of this group of Study Plan: Code=4.S.BPMED VÝB R 12/1 Name=4.sem.MED výb r p edm t 12/13

14EAT	Economic Analyses in Spreadsheets Programs Environment	KZ	2
Work with spreadsheet programs with the respect to economic problems, use of nested functions and conditional formatting, statistic and mathematic functions. Creation of graphs and other graphic outputs. Data analysis, lists and contingent tables.			
14WS1	Webdesign With Web Standards 1	KZ	2
HTTP, URL, markup languages HTML and XHTML, anchors, tables, images, lists, forms, features of CSS, rules of accessible web pages, usability of web pages, problems of different browsers, one, two and three column pages, page validation, conditional comments, CSS hacks.			

Code of the group: 5.S.BPMED 13/14

Name of the group: 5.sem.MED bak.prez.13/14

Requirement credits in the group: In this group you have to gain 21 credits

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

Credits in the group: 21

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
17LOS	Logistic Systems	Z,ZK	3	2+1	Z	z
17TGA	Graph Theory and its Applications in Transport <i>Alena Rybíková, Denisa Mocková, Dušan Teichmann</i>	Z,ZK	4	2+2+1	Z	z
14DB	Database Systems	KZ	2	0+2	Z	z
17DNV	Transportation of Dangerous Goods	KZ	2	2+0	Z	z
17FIF	Finances and Financing	KZ	2	2+0	Z	z
17MSTP	Small and Medium Enterprise	KZ	2	2+0	Z	z
17PDO	Designing of Public Transport Services	KZ	3	2+1	Z	z
23KM	Crisis Management	KZ	2	2+0	Z	z
17TCHR	Tourist Trade Techniques	Z	1	2+0	Z	z

Characteristics of the courses of this group of Study Plan: Code=5.S.BPMED 13/14 Name=5.sem.MED bak.prez.13/14

17LOS	Logistic Systems	Z,ZK	3
Definition of logistics, development and science basics of logistics. Basic elements of logistic system, logistic chain. Technology in logistics. Goals and strategies of company logistic system. Transport in logistic system. Logistic technologies in air, rail and water transport. Information systems in logistics and passenger transport. Storage and distribution in logistics. Position of logistics in the Czech Republic and Europe.			
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.			
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.			

17DNV	Transportation of Dangerous Goods	KZ	2
Legal measures. Kinds of hazards. Classification. Carriage by road, railways, inland waterways, air and maritime transport. Obligations of consignors, carriers, consignees and safety advisors. System of international obligatory conditions. Enumerated list of dangerous goods. Packing and marking of packages. Transport documentation. Exempted and unlimited quantity. Crew, equipment, approval, marking, operation and construction of road vehicles.			
17FIF	Finances and Financing	KZ	2
Cash flow, cost and revenue flow. Financial system functions. Financial assets. Types of financing. Company cash flow. Short-term financing instruments. Long-term financing instruments. Trading financial instruments. Banking financial instruments. Financial risk allocation instruments. Payment and hedging instruments. Loan capital. Risk capital.			
17MSTP	Small and Medium Enterprise	KZ	2
SME, design, plan, market, analysis, finance, management, decision making, survival, growth.			
17PDO	Designing of Public Transport Services	KZ	3
Transport planning, demand elasticity. Strategy and hierarchical planning of public transport system. Line network planning, concept of offer. Integrated periodic timetable. Planning process of long-distance and regional transport. Optimised number of rolling-stock, circulation plan of rolling-stock, rolling-stock strategy. Public service liability for various segments. Harmony of particular long-term plans. Controlled competition. Case studies.			
23KM	Crisis Management	KZ	2
Theory and legal frame of crisis management with direction to Rescue system (IZS). After introduction to safety domain, there are terms and knowledge on theory and position of crisis management and its targets, IZS-crisis management-crisis planning and basic legislation. Practical part is concentrated to responsibility matrix compilation.			
17TCHR	Tourist Trade Techniques	Z	1
Development and importance of the tourist trade, summary of tourist trade services with more detailed analysis of transport services and means of transport in the air, water and land (rail and road) transport.			

Code of the group: 5.S.BPMED VÝB R 12/1

Name of the group: 5.sem.MED výb r p edm tu 12/13

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) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
14TEU	Creation of Scripts and Macros for Economic Tasks	KZ	2	0+2	Z	z
14WS2	Webdesign With Web Standards 2	KZ	2	0+2	Z	z

Characteristics of the courses of this group of Study Plan: Code=5.S.BPMED VÝB R 12/1 Name=5.sem.MED výb r p edm tu 12/13

14TEU	Creation of Scripts and Macros for Economic Tasks	KZ	2
Fundamentals of VBA, functions and procedures, examples of their use. Forms and offers for user oriented applications, cooperation with other applications, solution to compatibility problems among different spreadsheet programs versions. Everything with the respect to economic tasks.			
14WS2	Webdesign With Web Standards 2	KZ	2
Advanced CSS techniques. Multi-level menu. SEO - Search Engine Optimization. Web technologies: JavaScript, Flash, PHP, AJAX. AccessKey, Favicon, rollovers, lightboxes. Using API for maps or searching. Audit and page statistics. Use of useful scripts. Systems for content management.			

Code of the group: 6.S.BPMED 13/14

Name of the group: 6.sem.MED bak.prez. 13/14

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 10 courses

Credits in the group: 23

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
17ERP	Company Economy and Management	Z,ZK	3	2+1	L	z
17MPD	Management of Technonology Systems of Land Transport	Z,ZK	3	2+1	L	z
17ODS	Optimization on Transportation Networks	Z,ZK	3	2+1	L	z
17PZL	Carriage and Forwarding	Z,ZK	3	2+1	L	z
14ISYS	Information Systems	KZ	2	2+0	L	z
17DU	Public Transport Service in a Territory	KZ	2	2+0	L	z
17KS	Quality of Transport and Telecommunication Systems	KZ	2	2+0	L	z
17MR	Managerial Decision Making	KZ	3	2+1	L	z
17DAS	Transportation and Communication Law	Z	1	2+0	L	z
17TAC	Tariffs and Prices in Transport	Z	1	2+0	L	z

Characteristics of the courses of this group of Study Plan: Code=6.S.BPMED 13/14 Name=6.sem.MED bak.prez. 13/14

17ERP	Company Economy and Management	Z,ZK	3
Company and its neighbourhood, structure of assets and liabilities, depreciation, costs, revenues and profit, break-even point, costing, inventory, financial management, investment appraisal, basics of management, organizational structures, human resources management, marketing, company strategy, business plan.			
17MPD	Management of Technology Systems of Land Transport	Z,ZK	3
Structure of vehicle systems, rational assessment, decision making in the managing activity, operation-technical and economic properties, technological subsystems in the field of the road and rail transport.			
17ODS	Optimization on Transportation Networks	Z,ZK	3
Introduction to optimization and heuristic methods, metaheuristic methods, the history of optimization. Lagrangean approach, assignment problem - Hungarian method, minimum weighted matching, Little's algorithm, vehicle routing problem - an extension of TSP, heuristic solution approaches to vehicle routing problem, local search techniques, Tabu Search, location problems - heuristic algorithms, genetic algorithms and extensions of genetic algorithms.			
17PZL	Carriage and Forwarding	Z,ZK	3
Carriage, forwarding, economy, transport, supply, storage, warehouses, goods, passengers, insurance, distribution, customs.			
14ISYS	Information Systems	KZ	2
State-of-the-art tools of objects control (control and planning) including problems related to these tools use, theory of information and knowledge, knowledge and expert systems, IS planning methodologies, transaction systems, theory of computer networks, semantic webs and sensitivity analysis.			
17DU	Public Transport Service in a Territory	KZ	2
Transport policy. Impact of European integration. Configuration and links. Contract ensuring. Funding. Tariff and ticketing system. Legal conditions. Survey and quantification of carriage demand. Transport scheduling. Quality criteria and standards. IT, Publicity, Promotion, Marketing. Case study on an Integrated Public Transport System.			
17KS	Quality of Transport and Telecommunication Systems	KZ	2
Quality, systems, company, customer, norms, assessment, methods, indicators, satisfaction, loyalty.			
17MR	Managerial Decision Making	KZ	3
Decision making, rationality, process, state of the world, CPM, PERT, trees, group, certainty, risk, uncertainty, preference.			
17DAS	Transportation and Communication Law	Z	1
Transportation and communication law - railway, road transport, ropeway, water road, air transport, telecommunication, post, patent.			
17TAC	Tariffs and Prices in Transport	Z	1
Transport and division of labour. Costs in transport. External costs. Financing of traffic in transport. Prices and tariffs. Tariffs of railway transport. Tariffs of road transport. Tariffs of air and water contract. Transport market. Service arrangement in public interest. Pricing policy history. Pricing in the EU.			

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) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
11X31	Project 1 Bohumil Ková, Jan P ikryl, Ivan Nagy, Evženie Uglickich Jan P ikryl Jan P ikryl (Gar.)	Z	2	0P+1C	L	ZP
12X31	Project 1 Josef Kocourek, Roman Dostál, Aneta Matysková, Jan Ondrá ek, Ji í arský, Tomáš Pad lek, Petr Kumpošt, Zuzana arská, Dagmar Ko árková,	Z	2	0P+1C	L	ZP
14X31	Project 1 Vít Fábera, Jana Kalíková	Z	2	0P+1C	L	ZP
15X31	Project 1	Z	2	0P+1C	L	ZP
16X31	Project 1 Josef Mík, P emysl Toman, Dmitry Rozhdestvenskiy	Z	2	0P+1C	L	ZP
17X31	Project 1 Milan K íž, Otto Pastor, Alena Rybi ková, Denisa Mocková, Dušan Teichmann, Daniel Pilát, Markéta Braun Kohlová, Veronika Faifrová, Rudolf Vávra,	Z	2	0P+1C	L	ZP
18X31	Project 1 Jan Šleichrt, Jaroslav Valach, Jan Falta, Michaela Neuhäuserová, Tomáš Fíla	Z	2	0P+1C	L	ZP
20X31	Project 1 Martin Leso, Ji í R ži ka, Milan Sliacky	Z	2	0P+1C	L	ZP
21X31	Project 1 Terézia Pilmannová, Jakub Steiner, Jakub Kraus, Peter Vítek, Andrej Lališ, Jakub Hospodka, Slobodan Stoji, Stanislav Pleninger, Vladimír Socha,	Z	2	0P+1C	L	ZP
22X31	Project 1 Michal Frydrýn, Karel Kocián, Luboš Nouzovský, Zden k Svatý	Z	2	0P+1C	L	ZP
23X31	Project 1 Milena Macková	Z	2	0P+1C	L	ZP
11X32	Project 2 Bohumil Ková, Jan P ikryl, Ivan Nagy, Evženie Uglickich, Ond ej P ibyl Ond ej P ibyl Bohumil Ková (Gar.)	Z	2	0P+2C	Z	ZP

12X32	Project 2 Josef Kocourek, Roman Dostál, Jiří arský, Jan Gallia, Tomáš Padlek, Petr Kumpošt, Zuzana arská, Dagmar Koárková, Kristýna Neubergová,	Z	2	0P+2C	Z	ZP
14X32	Project 2 Martin Šrotý, Vít Fábera, Jana Kaliková, Marek Kalika, Ota Hajzler	Z	2	0P+2C	Z	ZP
15X32	Project 2	Z	2	0P+2C	Z	ZP
16X32	Project 2 Josef Mík, P emysl Toman	Z	2	0P+2C	Z	ZP
17X32	Project 2 Milan Kříž, Otto Pastor, Alena Rybíková, Denisa Mocková, Dušan Teichmann, Daniel Pilát, Veronika Fařřová, Petr Fridrišek, Stanislav Metelka,	Z	2	0P+2C	Z	ZP
18X32	Project 2 Daniel Kytý, Jaroslav Valach	Z	2	0P+2C	Z	ZP
20X32	Project 2 Martin Leso, Jiří Růžka	Z	2	0P+2C	Z	ZP
21X32	Project 2 Terézia Pilmannová, Jakub Steiner, Peter Vittek, Andrej Lališ, Jakub Hospodka, Slobodan Stojić, Stanislav Pleninger, Vladimír Socha, Lenka Hanáková,	Z	2	0P+2C	Z	ZP
22X32	Project 2 Michal Frydryn, Karel Kocián, Luboš Nouzovský, Zdeněk Svatý, Tomáš Míunek	Z	2	0P+2C	Z	ZP
23X32	Project 2 Václav Jirovský, Milena Macková	Z	2	0P+2C	Z	ZP
11X33	Project 3 Bohumil Ková, Jan Píkryl, Ivan Nagy, Evžen Uglickich Jan Píkryl Jan Píkryl (Gar.)	Z	2	0P+1C	L	ZP
12X33	Project 3 Josef Kocourek, Roman Dostál, Aneta Matysková, Jan Ondráček, Jiří arský, Tomáš Padlek, Petr Kumpošt, Zuzana arská, Dagmar Koárková,	Z	2	0P+1C	L	ZP
14X33	Project 3 Martin Šrotý, Vít Fábera, Jana Kaliková, Ota Hajzler, Zdeněk Lokaj, Tomáš Zelinka	Z	2	0P+1C	L	ZP
15X33	Project 3	Z	2	0P+1C	L	ZP
16X33	Project 3 Josef Mík, P emysl Toman	Z	2	0P+1C	L	ZP
17X33	Project 3 Milan Kříž, Otto Pastor, Alena Rybíková, Denisa Mocková, Dušan Teichmann, Daniel Pilát, Markéta Braun Kohlová, Veronika Fařřová, Rudolf Vávra,	Z	2	0P+1C	L	ZP
18X33	Project 3 Jan Šleicert, Jaroslav Valach, Jan Falta, Michaela Neuhäuserová, Tomáš Fila	Z	2	0P+1C	L	ZP
20X33	Project 3 Martin Leso, Jiří Růžka	Z	2	0P+1C	L	ZP
21X33	Project 3 Terézia Pilmannová, Jakub Steiner, Jakub Kraus, Peter Vittek, Andrej Lališ, Jakub Hospodka, Slobodan Stojić, Stanislav Pleninger, Vladimír Socha,	Z	2	0P+1C	L	ZP
22X33	Project 3 Michal Frydryn, Karel Kocián, Luboš Nouzovský, Zdeněk Svatý	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 elective courses

Minimal number of credits of the block: 6

The role of the block: PV

Code of the group: Y1-BMED 13/14

Name of the group: PVP bak.prez. MED 13/14

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

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

Credits in the group: 6

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) <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	KZ	2	2P+0C	Z	PV
14Y1AV	Animation and Visualization	KZ	2	2P+0C	L	PV
14Y1AP	Automatization in Mail	KZ	2	2+0	Z	PV
14Y1BE	Barrierless Transport	KZ	2	2P+0C	L	PV
15Y1BO	Work Safety and Health Protection in Transportation <i>Petr Musil, Eva Rezlerová</i>	KZ	2	2P+0C	L	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
17Y1DZ	Transported Commodities Cognization	KZ	2	2+0	L	PV
18Y1D1	Dynamics of Routes and Vehicles 1	KZ	2	2+0	Z	PV
17Y1EV	Public Sector Economy	KZ	2	2P+0C	Z	PV
16Y1EN	Energy Requirements of Vehicles <i>Jaroslav Opava</i>	KZ	2	2P+0C	L	PV
15Y1EH	European Integration within Historical Context <i>Eva Rezlerová, Jan Feit</i>	KZ	2	2P+0C	Z	PV
18Y1EV	Experimental Methods and Numerical Modelling	KZ	2	2+0	L	PV
15Y1FD	French Area Studies and Transportation <i>Eva Rezlerová, Irena Veselková</i>	KZ	2	2P+0C	L	PV
14Y1GD	GIS and Maps Digitalization	KZ	2	2+0	Z	PV
14Y1HW	Computer Hardware	KZ	2	2P+0C	L	PV
15Y1HL	History of Civil Aviation <i>Jakub Kraus, Eva Rezlerová, Vladimír Plos</i>	KZ	2	2P+0C	L	PV
15Y1HD	History of City Mass Transport <i>Milan Dont, Eva Rezlerová, Jan Feit</i>	KZ	2	2P+0C	Z	PV
12Y1HD	Traffic Noise <i>Libor Ládyš</i>	KZ	2	2P+0C	L	PV
15Y1HE	Work Hygiene and Ergonomics in Traffic <i>Petr Musil, Eva Rezlerová, Jan Feit</i>	KZ	2	2P+0C	Z	PV
20Y1IC	Human Machine Interaction	KZ	2	2+0	L	PV
16Y1KJ	Railroad Vehicles	KZ	2	2+0	L	PV
12Y1KN	Combined Transportation	KZ	2	2P+0C	Z	PV
20Y1K	Cybernetics	KZ	2	2+0	Z	PV
21Y1LM	Aviation Meteorology	KZ	2	2+0	L	PV
21Y1LR	Radio Technology in Aviation	KZ	2	2+0	L	PV

11Y1LP	Linear Programming	KZ	2	2+0	L	PV
17Y1LL	Logistics of Passenger and Freight Air Transport <i>Petra Skollilová</i>	KZ	2	2P+0C	L	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
17Y1ND	Maritime Transportation	KZ	2	2+0	Z	PV
14Y1NH	Databases Design and Programming	KZ	2	2+0	L	PV
14Y1NP	Non-parametric 3D Modelling	KZ	2	2+0	Z	PV
20Y1NS	Neural Networks	KZ	2	2+0	Z	PV
20Y1OI	Fare Collection and Information Systems <i>Milan Sliacky, Patrik Horaž ovský</i>	KZ	2	2P+0C	L	PV
14Y1OL	Linux Operating System	KZ	2	2+0	Z	PV
17Y1OF	Personal Finance	KZ	2	2P+0C	Z	PV
15Y1OP	Turning Points of the Czech Nation	KZ	2	2+0	L	PV
11Y1PV	Parametrical and Multicriterial Programming <i>Olga Vraštilová Olga Vraštilová (Gar.)</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
20Y1PO	Weather, Air Quality and Transportation	KZ	2	2+0	Z	PV
14Y1PG	Computer Graphics	KZ	2	2P+0C	L	PV
11Y1PE	Computer Controlled Experiments	KZ	2	2+0	L	PV
14Y1PM	Advanced Methods of Parametric Programming	KZ	2	2+0	L	PV
21Y1PU	Aircraft Maintenance Technology	KZ	2	2+0	L	PV
12Y1PD	Assessment of Transport Structures <i>Kristýna Neubergová</i>	KZ	2	2P+0C	Z	PV
14Y1PJ	C Programming Language <i>Vít Fábera Vít Fábera (Gar.)</i>	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
16Y1PV	Operation, Construction and Maintenance of Vehicles	KZ	2	2P+0C	L	PV
12Y1PU	Organization Disposition of Railway Stations <i>Martin Jacura</i>	KZ	2	2P+0C	L	PV
12Y1RZ	Railway Lines Reconstruction	KZ	2	2+0	Z	PV
16Y1RE	Control and Electronic Vehicle Systems <i>Josef Mik, P emysl Toman, Ji í First</i>	KZ	2	2P+0C	Z	PV
17Y1ST	Titan Simulation	KZ	2	2P+0C	L	PV
20Y1SC	Sensors and Actuators <i>Pavel Hrubeš</i>	KZ	2	2P+0C	L	PV
11Y1SI	Transportation Software Engineering <i>Martin P ni ka Martin P ni ka (Gar.)</i>	KZ	2	2P+0C	Z	PV
12Y1SU	Road Management and Maintenance	KZ	2	2P+0C	L	PV
18Y1SN	Statically Nondetermined Structures	KZ	2	2+0	Z	PV
16Y1TJ	Technological Quality Aspects	KZ	2	2+0	Z	PV
20Y1TE	Technology of Electronic Systems	KZ	2	2+0	L	PV
20Y1TD	Telematics Databases	KZ	2	2+0	Z	PV
11Y1TG	Graph Theory <i>Lucie Kárná Lucie Kárná</i>	KZ	2	2P+0C	L	PV
16Y1TZ	Transporting Devices	KZ	2	2+0	L	PV
14Y1TI	Creating Interactive Internet Applications	KZ	2	2P+0C	L	PV
18Y1UK	Introduction of Rail Vehicles <i>Josef Kolá</i>	KZ	2	2P+0C	L	PV
14Y1VB	Visual Basic	KZ	2	2+0	L	PV
12Y1VC	Waterways and Shipping	KZ	2	2P+0C	Z	PV
12Y1VD	Water Transport and Transportation	KZ	2	2+0	L	PV
14Y1VM	Development of Applications for Mobile Devices	KZ	2	2P+0C	Z	PV
16Y1ZG	Introduction into Applied Computer Graphics <i>Adam Orlický, Stanislav Novotný, Ond ej Piksa</i>	KZ	2	2P+0C	L	PV
11Y1ZF	Introduction to Solid State Physics	KZ	2	2+0	Z	PV

14Y1ZM	Fundamentals of parametric and adaptive modeling	KZ	2	2P+0C	L	PV
11Y1ZM	Foundation of MATLAB Programming <i>Pavla Pecherková</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	KZ	2	2P+0C	Z	PV

Characteristics of the courses of this group of Study Plan: Code=Y1-BMED 13/14 Name=PVP bak.prez. MED 13/14

17Y1AF	Alternative Forms of Transportation Project Financing 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.	KZ	2			
18Y1AM	Anatomy, Mobility and Safety of Man 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.	KZ	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			
14Y1AP	Automatization in Mail Technology of post shipment submission, transport, and delivery via physic and electronic way, virtual post operation. Technology of information transmission by electronic way, application of new information and communication technologies in an offer of permanent, mobile, and NGN e-communication networks, solutions to e-communication network interfaces, technological principles of end telecommunication devices.	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			
15Y1BO	Work Safety and Health Protection in Transportation 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.	KZ	2			
15Y1DU	History of Art and Society 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.	KZ	2			
15Y1DZ	History of Railway 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.	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			
17Y1DZ	Transported Commodities Cognization Useful features. Quality. Testing. Standardization. Features relevant for the transport. Packing. Stress. Protection of goods and damage prevention during the carriage. Optimization of the choice and effective transport means utility.	KZ	2			
18Y1D1	Dynamics of Routes and Vehicles 1 Theory and analysis of vibration of multimass systems. Dynamical model of vehicle and interaction with transport structure. Assessment of structure vibration and allowable criteria. Vibroisolation and absorbers of dynamical effects. Methods of experimental dynamics. FEM in structure dynamics.	KZ	2			
17Y1EV	Public Sector Economy Economic and financial theory of public sector, public choice theory, externalities, decisions about public finance allocation, economic assesment of public projects (CBA, MCA, CEA), tax system of the CR, state budget, management of public projects a their economic efficiency assessment, way of elaboration of PPP projects, funding from EU funds, program HDM-4.	KZ	2			
16Y1EN	Energy Requirements of Vehicles 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.	KZ	2			
15Y1EH	European Integration within Historical Context 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.	KZ	2			
18Y1EV	Experimental Methods and Numerical Modelling Physical properties measured in structural mechanics and dynamics. Principles of strain gauge measurement. Theory of photoelasticimetry, experimental methods in structural dynamics. Basic principles of numerical methods in structural mechanics and dynamics. Finite element method in statics and dynamics. Geometry development, discretization to elements, types of structural elements. Boundary conditions. Material models. Solution of problems.	KZ	2			
15Y1FD	French Area Studies and Transportation 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.	KZ	2			
14Y1GD	GIS and Maps Digitalization Work with map sources and their creating. Maps digitalization and creation. Use and creation of other (non-graphic) information with use of databases. Interlinking external references with drawings containing maps.	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			

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, standarts, regulations. Creation acoustic climate in area, principles of urban acoustic, noise transmission, soundproofing. Types of noise sources in area. Determination of acoustic situation in the area of interest. Methodology of computing and measurement of transport noise. Acoustic studies, measuring protocol.			
15Y1HE	Work Hygiene and Ergonomics in Traffic	KZ	2
Basic knowledge of occupational hygiene and ergonomics, and their application in transport. Working environment factors, and the influence of these factors on health of workers. Creation and protection of working conditions that do not damage public health. Mutual links: man-machine-environment. Adaptation of technology to possibilities and skills of a man. Practical examples from the field of transportation; relevant legislature.			
20Y1IC	Human Machine Interaction	KZ	2
Interaction of human-system. Methods and procedures for detecting decrease in attention. Used software and hardware tools. Bio-feedback, EEG measurements.			
16Y1KJ	Railroad Vehicles	KZ	2
21st century mobility. Recent construction of railroad, city and intercity public vehicles, future and present situation, speed as a solution, maglev. From principle to design and construction; some realization in the world. Division and ways of drive, efficient electronics, changers, railroad traction, energetic calculation. Railroad safety signalling systems, railroad vehicle and infrastructure compliance (interference). Testing.			
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.			
20Y1K	Cybernetics	KZ	2
Fundamentals of information theory, dynamic systems, the principle of feedback, logical systems. Finite automata as a special case of dynamical systems. Relations between languages and automata.			
21Y1LM	Aviation Meteorology	KZ	2
Structure of atmosphere. Vertical stratification. Pressures QNH, QFE, QFF, QME. Instability. Atmospheric fronts. Atmospheric precipitation, origin & categorisation. Turbulence. Forces producing wind. Cyclone and anticyclone. Gradient wind. Geostrophical and geocyclostrophical wind. Visibilities in air transport. Dangerous meteorological aspects. Meteorological maps. Climatology. Circulation. Intertropical front. Meteorological information.			
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.			
11Y1LP	Linear Programming	KZ	2
Definition of the optimization problem of linear programming, application of the linear programming on economic and technical problems, normal traffic problems and traffic problems with constrains. Geometrical interpretation of linear programming problems, simplex method, duality principle.			
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.			
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.			
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.			
14Y1NH	Databases Design and Programming	KZ	2
Students in this course will deepen their knowledge and skills in database design and learn the procedural extension of SQL, PL/SQL, which makes it possible to ensure data integrity on the level of the database engine.			
14Y1NP	Non-parametric 3D Modelling	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.			
20Y1NS	Neural Networks	KZ	2
The basic structure and function of human brain and its main functional blocks and building elements - neurons. Models of neurons, modelling their networks and the basic paradigms of artificial neural networks.			
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).			
14Y1OL	Linux Operating System	KZ	2
Distributions. GNU/Linux system installation. X-window system. Rights - Users and Groups, ACL rights. Filesystems and file attributes. Programs and processes. Boot of OS, runlevels. Basic console commands. Configuration files. Managing SW system. Programs in graphic mode - tools for text, graphics, sound, video, communication. Services management. Principles of OS secure configuration. 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).			

15Y1OP	Turning Points of the Czech Nation	KZ	2
Crucial moments of more than a thousand-year long history of Western Slavs in Central Europe. Emphasis on relations to bordering nations and Europe as a whole. The Premyslid state. Lands of the Czech Crown as a part of Habsburgh monarchy. 19th century political programmes. Foundation of Czechoslovakia. Disputes over the sense of Czech history. Changes of power structure in Europe during 20th century and the position of the Czech nation.			
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.			
20Y1PO	Weather, Air Quality and Transportation	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.			
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.			
11Y1PE	Computer Controlled Experiments	KZ	2
Implementation of experiment consisting of designing, measurement method selection according to required results accuracy and available measurement devices, selection of computer-recorded parameters, data acquisition and results calculation. Evaluation of measurement method accuracy and result uncertainty.			
14Y1PM	Advanced Methods of Parametric Programming	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.			
21Y1PU	Aircraft Maintenance Technology	KZ	2
Basics of aircraft maintenance technology, legislation, aircraft release into operation, safety, equipment.			
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.			
14Y1PJ	C Programming Language	KZ	2
C programming language. Preprocessor, basics of the C language (data types, syntax, commands), functions, 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.			
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.			
12Y1RZ	Railway Lines Reconstruction	KZ	2
Principles of track maintenance technology. Track maintenance machinery, superstructure and substructure building machinery and special rail vehicles. Degradation of track geometrical parameters - causes and elimination principles. Track sections and station tracks exclusion planning. Reconstruction timetable design of railway superstructure and substructure.			
16Y1RE	Control and Electronic Vehicle Systems	KZ	2
Elementary concepts of regulation. Tools for analytical solution, linear system description. Basic types of a regulator (PID), properties, advantages, disadvantages, function. Conventional and hybrid drive control. Electric drive. Vehicle communication bus (CAN, LIN, FlexRay, ISObus, KWP2000 protocole etc.). Vehicle electronic control, safety, communication and comfort systems.			
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.			
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.			
18Y1SN	Statically Nondetermined Structures	KZ	2
Deformations of the beam element, virtual work. Strength method. Frame analysis by strength method. Deformation method. Frame analysis by deformation method. Simple planar grid. Beam on elastic Winkler's foundation. Calculation beam on elastic foundation. Basement of the mathematical elasticity. Calculation of walls. Calculation of plates. Cylindrical shells. Examples of calculations.			

16Y1TJ	Technological Quality Aspects	KZ	2
Certification and accreditation. Quality management. Standards of Quality Management and its application. Quality system creation. Tools and methods of quality improvement. Conformity verification. Environmental certification. Workplace certification. QMS integration. Classification, certification of products and producers.			
20Y1TE	Technology of Electronic Systems	KZ	2
Characteristics of the technological process, the relation of the design, construction and technology. General scheme of technological process. Principles and characteristics of basic electronic elements. Basic technology of integrated circuits. Synthesis of integrated circuits. Higher levels of technology components. Measurement, diagnostics, reliability. Operational aspects of electronic systems.			
20Y1TD	Telematics Databases	KZ	2
Issue of telematics databases, work with OpenStreetMap layer, use of Linux OS and PostgreSQL with PostGIS extension, real traffic data.			
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.			
16Y1TZ	Transporting Devices	KZ	2
Flow of masses, material transport technology, loose material transport - conveyors with tractive elements, conveyors without tractive elements, transport of piece material - continual transport devices, cyclic transport devices, crane mechanisms, steel constructions. Vertical transport, transport in mines, long-distance conveyor belt transport.			
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.			
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.			
14Y1VB	Visual Basic	KZ	2
Applications developing for Visual Basic on MS-Windows .NET platform with use of .NET libraries or Visual Studio tools for graphic or console mode. Further, creation of installation utilities for these applications. Work with VBA at superstructures creation for MS-Windows applications supporting VBA.			
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.			
12Y1VD	Water Transport and Transportation	KZ	2
Technologické možnosti vnitrozemské plavby. Základní rozdělení vnitrozemských plavidel a jejich základní parametry. Základy konstrukce a stavby plavidel. Efektivnost vodní dopravy a finanční náročnost výstavby infrastruktury vodní dopravy. Poptávka po vodní dopravě v České republice. Způsob financování investic a provozních nákladů infrastruktury vodní dopravy (vodní cesty, přístavy lodnice apod.). Národní doprava obecně a v podmínkách ČR.			
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.			
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.			
11Y1ZF	Introduction to Solid State Physics	KZ	2
Structure of solids, crystal lattice, Bloch function, Brillouin zones. Band theory of solids. Dynamics of 1D lattice. Phonons. Thermodynamic properties of solids. Semiconductors. Magnetism.			
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 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.			

Name of the block: Jazyky

Minimal number of credits of the block: 12

The role of the block: J

Code of the group: JZ-B-3.4 12/13

Name of the group: Jazyk bak. 5.6.sem. od 12/13

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
15JZ3A	Foreign Language - English 3	Z	3	0+4	Z	J
15JZ4A	Foreign Language - English 4	Z,ZK	3	0+4	L	J
15JZ3F	Foreign Language - French 3 <i>Eva Rezlerová, Jan Feit, Irena Veselková</i>	Z	3	CP+4C+10B	Z	J
15JZ4F	Foreign Language - French 4 <i>Eva Rezlerová, Irena Veselková</i>	Z,ZK	3	CP+4C+10B	L	J
15JZ3N	Foreign Language - German 3 <i>Eva Rezlerová, Jan Feit, Barbora T hníková, Ester Prokešová, Jana Štikarová</i>	Z	3	CP+4C+10B	Z	J
15JZ4N	Foreign Language - German 4 <i>Eva Rezlerová, Jana Štikarová</i>	Z,ZK	3	CP+4C+10B	L	J
15JZ3R	Foreign Language - Russian 3 <i>Eva Rezlerová, Jan Feit, Marie Michlová</i>	Z	3	CP+4C+10B	Z	J
15JZ4R	Foreign Language - Russian 4 <i>Eva Rezlerová, Marie Michlová</i>	Z,ZK	3	CP+4C+10B	L	J
15JZ3S	Foreign Language - Spanish 3 <i>Eva Rezlerová, Jan Feit, Nina Hricsina Puškinová</i>	Z	3	CP+4C+10B	Z	J
15JZ4S	Foreign Language - Spanish 4 <i>Eva Rezlerová, Nina Hricsina Puškinová</i>	Z,ZK	3	CP+4C+10B	L	J

Characteristics of the courses of this group of Study Plan: Code=JZ-B-3.4 12/13 Name=Jazyk bak. 5.6.sem. od 12/13

15JZ3A	Foreign Language - English 3 Grammar structure and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faculty's fields of study. Focus on improvement in perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral and written forms. Technical texts and their features; practice of oral and written presentation.	Z	3
15JZ4A	Foreign Language - English 4 Grammar structure and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faculty's fields of study. Focus on improvement in perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral and written forms. Technical texts and their features; practice of oral and written presentation.	Z,ZK	3
15JZ3F	Foreign Language - French 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.	Z	3
15JZ4F	Foreign Language - French 4 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.	Z,ZK	3
15JZ3N	Foreign Language - German 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.	Z	3
15JZ4N	Foreign Language - German 4 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.	Z,ZK	3
15JZ3R	Foreign Language - Russian 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.	Z	3
15JZ4R	Foreign Language - Russian 4 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.	Z,ZK	3
15JZ3S	Foreign Language - Spanish 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.	Z	3
15JZ4S	Foreign Language - Spanish 4 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.	Z,ZK	3

Code of the group: JZ-B-1,2 11/12

Name of the group: Jazyk bak.3.4.sem.od 11/12

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
15JZ1A	Foreign Language - English 1 <i>Eva Rezlerová, Jan Feit, Marie Michlová, Peter Morpuss, Dana Boušová, Jitka He manová, Lenka Monková, Markéta Olehlová, Markéta Vojanová,</i>	Z	3	CP+4C+10B		J
15JZ2A	Foreign Language - English 2 <i>Eva Rezlerová, Jan Feit, Marie Michlová, Peter Morpuss, Jitka He manová, Lenka Monková, Markéta Olehlová, Markéta Vojanová, Marek Tomek</i>	Z,ZK	3	CP+4C+10B		J
15JZ1F	Foreign Language - French 1	Z	3	0+4	Z	J
15JZ2F	Foreign Language - French 2	Z,ZK	3	0+4	L	J
15JZ1N	Foreign Language - German 1	Z	3	0+4	Z	J
15JZ2N	Foreign Language - German 2	Z,ZK	3	0+4	L	J
15JZ1R	Foreign Language - Russian 1	Z	3	0+4	Z	J
15JZ2R	Foreign Language - Russian 2	Z,ZK	3	0+4	L	J
15JZ1S	Foreign Language - Spanish 1	Z	3	0+4	Z	J
15JZ2S	Foreign Language - Spanish 2	Z,ZK	3	0+4	L	J

Characteristics of the courses of this group of Study Plan: Code=JZ-B-1,2 11/12 Name=Jazyk bak.3.4.sem.od 11/12

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.						
15JZ1F	Foreign Language - French 1				Z	3
Grammar structure and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faculty's fields of study. Focus on improvement in perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral and written forms. Technical texts and their features; practice of oral and written presentation.						
15JZ2F	Foreign Language - French 2				Z,ZK	3
Grammar structure and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faculty's fields of study. Focus on improvement in perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral and written forms. Technical texts and their features; practice of oral and written presentation.						
15JZ1N	Foreign Language - German 1				Z	3
Grammar structure and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faculty's fields of study. Focus on improvement in perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral and written forms. Technical texts and their features; practice of oral and written presentation.						
15JZ2N	Foreign Language - German 2				Z,ZK	3
Grammar structure and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faculty's fields of study. Focus on improvement in perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral and written forms. Technical texts and their features; practice of oral and written presentation.						
15JZ1R	Foreign Language - Russian 1				Z	3
Grammar structure and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faculty's fields of study. Focus on improvement in perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral and written forms. Technical texts and their features; practice of oral and written presentation.						
15JZ2R	Foreign Language - Russian 2				Z,ZK	3
Grammar structure and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faculty's fields of study. Focus on improvement in perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral and written forms. Technical texts and their features; practice of oral and written presentation.						
15JZ1S	Foreign Language - Spanish 1				Z	3
Grammar structure and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faculty's fields of study. Focus on improvement in perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral and written forms. Technical texts and their features; practice of oral and written presentation.						
15JZ2S	Foreign Language - Spanish 2				Z,ZK	3
Grammar structure and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faculty's fields of study. Focus on improvement in perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral and written forms. Technical texts and their features; practice of oral and written presentation.						

List of courses of this pass:

Code	Name of the course	Completion	Credits
00TVC1	Physical Education 1 Practical instruction and training in a wide variety of sports and games: from basic recreational coaching to competitive top level training. Included are: basketball, volleyball, soccer, tennis, squash, floorball, bodybuilding, swimming, canoeing, aerobic.	Z	1
00TVC2	Physical Education 2 Practical instruction and training in a wide variety of sports and games: from basic recreational coaching to competitive top level training. Included are: basketball, volleyball, soccer, tennis, squash, floorball, bodybuilding, swimming, canoeing, aerobic.	Z	1
11DAD	Differential and Difference Equations Difference equations and its systems. Some solvable types of differential equations of the first order. Linear differential equations of the n-th order. Methods for solution of the homogeneous equation, solution of inhomogeneous equation by means of variation of constants. Power series and their use for solution of differential equation. Boundary value problem. Eigennumbers and function for differential equation. Fourier series of function.	Z,ZK	3
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
11MSP	Modeling of Systems and Processes Mathematical methods and algorithms as a basis for system analysis. Methods for modelling and evaluating the systems in continuous and discrete time domain. Laplace transform, z-transform, and the recursive algorithms in solution of differential and difference equations, as an instrument for system description. Practical use of technical computing environment (MATLAB).	Z,ZK	4
11MTA	Mathematical Analysis Sequences and series of real numbers and its convergence. Basic properties of functions. Differential and integral calculus of the real function of one real variable. Power series, Fourier series and foundations of Fourier transform.	Z,ZK	4
11MVP	Mathematical Analysis of Function of More Variables Metric spaces, sequences in metric spaces, limit of sequence in metric space. Differential calculus of functions of several variables, differential of function, partial derivations, implicitly defined functions, extremes of functions of several variables. Integral calculus of functions of several variables, Riemann integral, integral over curves and surfaces in R ³ , application of integral calculus in physics.	Z,ZK	3
11PT	Probability Descriptive statistics. Basic probability concepts: elementary events and events, definitions and interpretation of probability. Random variable, probability distribution, probability mass and density, moments, some discrete and continuous distributions. Random vectors: joint and marginal distributions, mean vector, covariance matrix. Mixed distributions, mixture of distributions. Law of large numbers, central limit theorem.	Z	2
11SIS	Statistics Point estimation, properties of point estimators, methods of point estimation. Testing statistical hypothesis. Fit test, independence test. Regression and correlation, linear regression, correlation coefficient, coefficient of determination, general linear model, statistical inference in linear regression, analysis of variance, multiple regression, use of matrices in regression.	Z,ZK	2
11X31	Project 1	Z	2
11X32	Project 2	Z	2
11X33	Project 3	Z	2
11Y1LP	Linear Programming Definition of the optimization problem of linear programming, application of the linear programming on economic and technical problems, normal traffic problems and traffic problems with constrains. Geometrical interpretation of linear programming problems, simplex method, duality principle.	KZ	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
11Y1PE	Computer Controlled Experiments Implementation of experiment consisting of designing, measurement method selection according to required results accuracy and available measurement devices, selection of computer-recorded parameters, data acquisition and results calculation. Evaluation of measurement method accuracy and result uncertainty.	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
11Y1ZF	Introduction to Solid State Physics Structure of solids, crystal lattice, Bloch function, Brillouin zones. Band theory of solids. Dynamics of 1D lattice. Phonons. Thermodynamic properties of solids. Semiconductors. Magnetism.	KZ	2

11Y1ZM	Foundation of MATLAB Programming	KZ	2
To explain the principle of algorithmization, flow charts, description of MATLAB environment and its settings, MATLAB help, mathematical operators, matrices and elements operations, control flow, inputs and outputs, graphics, optimization and program code debugging.			
12MDE	Transport Models and Transport Excesses	Z,ZK	3
Parameters of the traffic flow and methods for their measurement. Models of the traffic flow, communications load, line and urban systems. Theory of queues, shock waves. Quality of transport and its assessment. Statistical characteristics of transport. Transport excesses, their analysis, the causes, identify and minimize the consequences. Improving of transport safety and fluency.			
12PKD	Rail Transport Designing	Z,ZK	3
Railway lines network. Vehicle and track relation. Traction. Track geometrical parameters. Clearance profile. Railway lines routing. Superstructure and substructure of the railway lines. Switches. Railway stations. City rail transport.			
12PPOK	Designing Roads, Highways and Motorways	KZ	3
Definition, types, ownership, maintenance, management and categorization of roads and highways. Curve and transition curve. Sinuosity and standard speed. Route in rural areas. Range of vision for stopping and overtaking. Road body - shapes and proportions, bottom and superstructure. Drainage and components of roads. Safety device. Crossings, junctions, intersections.			
12X31	Project 1	Z	2
12X32	Project 2	Z	2
12X33	Project 3	Z	2
12Y1C1	Designing Roads in Civil 3D I	KZ	2
The course is devoted to the traffic buildings design field, specifically the design of roads as such, by the means of a 3D software. Students go through the complete design of this particular linear building, from the initial situation, over the longitudinal section, to the model and work sections and the cubic capacity calculation. The course also includes a basic explanation of the traffic building design in the real-life profession.			
12Y1C2	Designing Roads in Civil 3D II	KZ	2
The course is devoted to the traffic buildings design field, specifically the design of roads as such, by the means of a 3D software. Students go through the complete design of this particular linear building, from the initial situation, over the longitudinal section, to the model and work sections and the cubic capacity calculation. The previously acquired skills are improved and developed. Students learn to design intersections.			
12Y1DS	Project Documentation in Practice	KZ	2
Project documentation creating. Project documentation types. Support materials for project documentation creating. Building permit obtaining process. Budget and pricing. Practical creation of some project documentation parts.			
12Y1HD	Traffic Noise	KZ	2
Acoustic introduction, basic terms, quantities. Basics of physiological acoustic, noise impacts on human body. Acoustic legislation, 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.			
12Y1KN	Combined Transportation	KZ	2
Combined transport strategy and legislation. Load units. Means of transport in combined transport. Combined transport systems. Transshipping areas. Multimodal logistic centres.			
12Y1PC	Pedestrian and Cycling Transport	KZ	2
Routes for pedestrians. Pedestrian crossings. Modifications for blind, dim-sighted and disabled people. Design of cycle routes network. Ways of cycle route layout and design parameters for cyclists. Separation of cyclists from other transport modes. Cycle tracks and its design - one way streets, reserved traffic lanes, bus stops, crossings with other transport modes, crossroads. Traffic signs and road marking for cyclists.			
12Y1PD	Assessment of Transport Structures	KZ	2
Assessment of transport structures, the EIA process. Multicriteria assessment methods, risk analysis, SWOT analysis. Landscape character, possibilities of its protection and assessment transport structures on the landscape. Rating fragmentation and landscape connectivity in the preparation of linear structures. Practical examples of assessment of traffic buildings on the environment.			
12Y1PU	Organization Disposition of Railway Stations	KZ	2
Connecting station. Passenger transport equipment. Freight transport equipment. Branch lines and railway traffic inside industrial company areas. Zone stations. Formation yards. Reserve stations. Technology of work in railway station with regard to its disposition. Railway station documentations in the Czech Republic railway network.			
12Y1RZ	Railway Lines Reconstruction	KZ	2
Principles of track maintainance technology. Track maintainance machinery, superstructure and substructure building machinery and special rail vehicles. Degradation of track geometrical parameters - causes and elimination principles. Track sections and station tracks exclusion planning. Reconstruction timetable design of railway superstructure and substructure.			
12Y1SU	Road Management and Maintenance	KZ	2
Getting familiar with ownership of roads in the Czech Republic and the administration of the road at the state and county level. It is presented development of road network, short, medium and long-term strategy of the Ministry of Transport. Maintenance of roads winter and summer, its requirements, specifics, possibilities and repair methods are discussed in the classroom as well as investment activity in highway engineering.			
12Y1VC	Waterways and Shipping	KZ	2
Basic modes of transport. The position of water transport in the transport system of the Czech Republic and the EU. Advantages and disadvantages of water transport. Basic systems of waterways in Europe, a network of waterways in the Czech Republic. Construction of the waterway and its equipment. Management of waterways and its operation. The legal regime in inland navigation, navigation rules of operation, navigation maps.			
12Y1VD	Water Transport and Transportation	KZ	2
Technologické možnosti vnitrozemské plavby. Základní rozdělení vnitrozemských plavidel a jejich základní parametry. Základy konstrukce a stavby plavidel. Efektivnost vodní dopravy a finanční náročnost výstavby infrastruktury vodní dopravy. Poptávka po vodní dopravě v České republice. Způsoby financování investic a provozních nákladů infrastruktury vodní dopravy (vodní cesty, přístavy lodí, níže apod.). Náročnost doprava obecně a v podmínkách ČR.			
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.			
12ZADI	Introduction to Transportation Engineering	Z,ZK	3
Traffic survey. Terrestrial roads. Residential zone. Land - use planning. Railway transport. Public mass transport. Integrated traffic systems. Traffic prognosis. Traffic safety. Air transport. Traffic and environment.			
13E	Economics	Z,ZK	3
Microeconomic and macroeconomic interpretation of economic relations. Method and subject of the economics. Economic decision making of consumers and producers. Market structures. Labour and capital, efficiency, ownership, public choice.			
13EDOT	Economy, Transport, Telecommunications	KZ	2
Transport, telecommunications, demand, supply, indicators, economic development, legislation, European union, regulation, liberalisation, transport modes, ITS, sustainability.			

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.			
14EAT	Economic Analyses in Spreadsheets Programs Environment	KZ	2
Work with spreadsheet programs with the respect to economic problems, use of nested functions and conditional formatting, statistic and mathematic functions. Creation of graphs and other graphic outputs. Data analysis, lists and contingent tables.			
14ISYS	Information Systems	KZ	2
State-of-the-art tools of objects control (control and planning) including problems related to these tools use, theory of information and knowledge, knowledge and expert systems, IS planning methodologies, transaction systems, theory of computer networks, semantic webs and sensitivity analysis.			
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).			
14SIAP	Networks and Protocols	KZ	2
Basic communication model, history and development of the Internet, principle of data transfer through computer networks (TCP/IP), performance of basic network protocols (ARP, RARP, TCP, UDP, Telnet, FTP, DNS, DHCP POP3, IMAP), data acquisition from the Internet sources, communicating ability via the Internet and fundamentals of own web presentation design by the means of web sites.			
14TEU	Creation of Scripts and Macros for Economic Tasks	KZ	2
Fundamentals of VBA, functions and procedures, examples of their use. Forms and offers for user oriented applications, cooperation with other applications, solution to compatibility problems among different spreadsheet programs versions. Everything with the respect to economic tasks.			
14UATT	Introduction to Automatization and Telecommunication Systems	KZ	2
Basic axioms of technical cybernetics, automatization in transportation, human as the weakest element, signalling in transportation, modelling and projecting of transport systems, integrated technological and information system in port, principle of telecommunication signal transmission, solving of telecommunication networks, modulating methods, multimedia networks and services, NGN networks.			
14UPRO	Introduction to Programming	KZ	2
Algorithm development, methods of structured programming, high-level programming languages, basics of C programming languages (types, variables, conditions, cycles, arrays, functions), programming techniques, complexity.			
14WS1	Webdesign With Web Standards 1	KZ	2
HTTP, URL, markup languages HTML and XHTML, anchors, tables, images, lists, forms, features of CSS, rules of accessible web pages, usability of web pages, problems of different browsers, one, two and three column pages, page validation, conditional comments, CSS hacks.			
14WS2	Webdesign With Web Standards 2	KZ	2
Advanced CSS techniques. Multi-level menu. SEO - Search Engine Optimization. Web technologies: JavaScript, Flash, PHP, AJAX. AccessKey, Favicon, rollovers, lightboxes. Using API for maps or searching. Audit and page statistics. Use of useful scripts. Systems for content management.			
14X31	Project 1	Z	2
14X32	Project 2	Z	2
14X33	Project 3	Z	2
14Y1AP	Automatization in Mail	KZ	2
Technology of post shipment submission, transport, and delivery via physical and electronic way, virtual post operation. Technology of information transmission by electronic way, application of new information and communication technologies in an offer of permanent, mobile, and NGN e-communication networks, solutions to e-communication network interfaces, technological principles of end telecommunication devices.			
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.			
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.			
14Y1GD	GIS and Maps Digitalization	KZ	2
Work with map sources and their creating. Maps digitalization and creation. Use and creation of other (non-graphic) information with use of databases. Interlinking external references with drawings containing maps.			
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.			
14Y1NH	Databases Design and Programming	KZ	2
Students in this course will deepen their knowledge and skills in database design and learn the procedural extension of SQL, PL/SQL, which makes it possible to ensure data integrity on the level of the database engine.			
14Y1NP	Non-parametric 3D Modelling	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.			
14Y1OL	Linux Operating System	KZ	2
Distributions. GNU/Linux system installation. X-window system. Rights - Users and Groups, ACL rights. Filesystems and file attributes. Programs and processes. Boot of OS, runlevels. Basic console commands. Configuration files. Managing SW system. Programs in graphic mode - tools for text, graphics, sound, video, communication. Services management. Principles of OS secure configuration. Remote administration.			
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.			
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.			

14Y1PM	Advanced Methods of Parametric Programming 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.	KZ	2
14Y1TI	Creating Interactive Internet Applications 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.	KZ	2
14Y1VB	Visual Basic Applications developing for Visual Basic on MS-Windows .NET platform with use of .NET libraries or Visual Studio tools for graphic or console mode. Further, creation of installation utilities for these applications. Work with VBA at superstructures creation for MS-Windows applications supporting VBA.	KZ	2
14Y1VM	Development of Applications for Mobile Devices Object oriented programming, Java programming language, development environment, operating system Android, development application - widgets, containers, threads, menu, permissions, services, GUI.	KZ	2
14Y1ZM	Fundamentals of parametric and adaptive modeling 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.	KZ	2
14ZAET	Fundamentals of Electrotechnics Basic electrotechnic terms, circuit quantities. Periodic courses characteristics. Electric circuits elements and basic circuit members. Assignating of bipoles and basic circuit elements. Solution to direct current circuits with a help of circuit analysis elementar methods: method of consecutive reduction, unloaded voltage divider, current divider. Transfiguration star-triangel and principle of superposition in direct current circuits.	KZ	2
14ZINF	Fundamentals of Informatics Introduction to faculty network, MS-Word and Open Office, use of styles and advanced features, computer functions and information transmission. Number systems incl. arithmetic calculations. Algorithms and their proprieties. Flow charts for algorithms drawing. Mathematic and logic ordering algorithms incl. functions and procedures. Work with MS-Excel - tables, graphs, calculations, functions.	KZ	2
15JZ1A	Foreign Language - English 1 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.	Z	3
15JZ1F	Foreign Language - French 1 Grammar structure and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faculty's fields of study. Focus on improvement in perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral and written forms. Technical texts and their features; practice of oral and written presentation.	Z	3
15JZ1N	Foreign Language - German 1 Grammar structure and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faculty's fields of study. Focus on improvement in perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral and written forms. Technical texts and their features; practice of oral and written presentation.	Z	3
15JZ1R	Foreign Language - Russian 1 Grammar structure and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faculty's fields of study. Focus on improvement in perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral and written forms. Technical texts and their features; practice of oral and written presentation.	Z	3
15JZ1S	Foreign Language - Spanish 1 Grammar structure and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faculty's fields of study. Focus on improvement in perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral and written forms. Technical texts and their features; practice of oral and written presentation.	Z	3
15JZ2A	Foreign Language - English 2 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.	Z,ZK	3
15JZ2F	Foreign Language - French 2 Grammar structure and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faculty's fields of study. Focus on improvement in perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral and written forms. Technical texts and their features; practice of oral and written presentation.	Z,ZK	3
15JZ2N	Foreign Language - German 2 Grammar structure and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faculty's fields of study. Focus on improvement in perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral and written forms. Technical texts and their features; practice of oral and written presentation.	Z,ZK	3
15JZ2R	Foreign Language - Russian 2 Grammar structure and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faculty's fields of study. Focus on improvement in perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral and written forms. Technical texts and their features; practice of oral and written presentation.	Z,ZK	3
15JZ2S	Foreign Language - Spanish 2 Grammar structure and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faculty's fields of study. Focus on improvement in perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral and written forms. Technical texts and their features; practice of oral and written presentation.	Z,ZK	3
15JZ3A	Foreign Language - English 3 Grammar structure and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faculty's fields of study. Focus on improvement in perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral and written forms. Technical texts and their features; practice of oral and written presentation.	Z	3
15JZ3F	Foreign Language - French 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.	Z	3

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.			
15JZ4A	Foreign Language - English 4	Z,ZK	3
Grammar structure and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faculty's fields of study. Focus on improvement in perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral and written forms. Technical texts and their 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.			
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.			
15Y1OP	Turning Points of the Czech Nation	KZ	2
Crucial moments of more than a thousand-year long history of Western Slavs in Central Europe. Emphasis on relations to bordering nations and Europe as a whole. The Premyslid state. Lands of the Czech Crown as a part of Habsburgh monarchy. 19th century political programmes. Foundation of Czechoslovakia. Disputes over the sense of Czech history. Changes of power structure in Europe during 20th century and the position of the Czech nation.			
16UDDM	Introduction to Transportation and Manipulation Technics	ZK	2
Means of transportation and transportation systems. Principles, functions and arrangement of means of transportation. Motors and their characteristics. Water transportation. Manipulating technics. Principles of lifting machines and conveyors. Legislature.			
16X31	Project 1	Z	2

16X32	Project 2	Z	2
16X33	Project 3	Z	2
16Y1EN	Energy Requirements of Vehicles 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.	KZ	2
16Y1KJ	Railroad Vehicles 21st century mobility. Recent construction of railroad, city and intercity public vehicles, future and present situation, speed as a solution, maglev. From principle to design and construction; some realization in the world. Division and ways of drive, efficient electronics, changers, railroad traction, energetic calculation. Railroad safety signalling systems, railroad vehicle and infrastructure compliance (interference). Testing.	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
16Y1TJ	Technological Quality Aspects Certification and accreditation. Quality management. Standards of Quality Management and its application. Quality system creation. Tools and methods of quality improvement. Conformity verification. Environmental certification. Workplace certification. QMS integration. Classification, certification of products and producers.	KZ	2
16Y1TZ	Transporting Devices Flow of masses, material transport technology, loose material transport - conveyors with tractive elements, conveyors without tractive elements, transport of piece material - continual transport devices, cyclic transport devices, crane mechanisms, steel constructions. Vertical transport, transport in mines, long-distance conveyor belt transport.	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, technics, 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
17DAS	Transportation and Communication Law Transportation and communication law - railway, road transport, ropeway, water road, air transport, telecommunication, post, patent.	Z	1
17DNV	Transportation of Dangerous Goods Legal measures. Kinds of hazards. Classification. Carriage by road, railways, inland waterways, air and maritime transport. Obligations of consignors, carriers, consignees and safety advisors. System of international obligatory conditions. Enumerated list of dangerous goods. Packing and marking of packages. Transport documentation. Exempted and unlimited quantity. Crew, equipment, approval, marking, operation and construction of road vehicles.	KZ	2
17DU	Public Transport Service in a Territory Transport policy. Impact of European integration. Configuration and links. Contract ensuring. Funding. Tariff and ticketing system. Legal conditions. Survey and quantification of carriage demand. Transport scheduling. Quality criteria and standards. IT, Publicity, Promotion, Marketing. Case study on an Integrated Public Transport System.	KZ	2
17EDTP	Economy and Management of Transport and Telecommunication Processes Transport and telecommunication system, financing of transport infrastructure, transport policy, transport service, energy sources, public goods, externalities in transport and their treatment, assessment of public projects, CBA method, transport company, costing in transportation, transport quality.	Z,ZK	3
17EM	Management Science Linear Programming, graphical interpretation and solution of LP problem. Types of distribution problems, transportation problem. Models of network analysis. Models of queuing theory. Models of inventory management. Simulation models.	KZ	2
17ERP	Company Economy and Management Company and its neighbourhood, structure of assets and liabilities, depreciation, costs, revenues and profit, break-even point, costing, inventory, financial management, investment appraisal, basics of management, organizational structures, human resources management, marketing, company strategy, business plan.	Z,ZK	3
17FIF	Finances and Financing Cash flow, cost and revenue flow. Financial system functions. Financial assets. Types of financing. Company cash flow. Short-term financing instruments. Long-term financing instruments. Trading financial instruments. Banking financial instruments. Financial risk allocation instruments. Payment and hedging instruments. Loan capital. Risk capital.	KZ	2
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
17HG	Economic Geography Introduction of the issues, definitions and introductory concepts. World geography and its research subject. Economic geography - Europe, Asia, Africa, Australia, America, the Czech Republic. Transport geography and its research subject. Characteristics of transportation as one of the branches of the global economy. Transport systems and their location in the world. Particular transport modes as part of the economy and the world transport system.	Z	2
17KS	Quality of Transport and Telecommunication Systems Quality, systems, company, customer, norms, assessment, methods, indicators, satisfaction, loyalty.	KZ	2
17LOS	Logistic Systems Definition of logistics, development and science basics of logistics. Basic elements of logistic system, logistic chain. Technology in logistics. Goals and strategies of company logistic system. Transport in logistic system. Logistic technologies in air, rail and water transport. Information systems in logistics and passenger transport. Storage and distribution in logistics. Position of logistics in the Czech Republic and Europe.	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
17MPD	Management of Technonology Systems of Land Transport Structure of vehicle systems, rational assessment, decision making in the managing activity, operation-technical and economic properties, technological subsystems in the field of the road and rail transport.	Z,ZK	3

17MR	Managerial Decision Making Decision making, rationality, process, state of the world, CPM, PERT, trees, group, certainty, risk, uncertainty, preference.	KZ	3
17MSTP	Small and Medium Enterprise SME, design, plan, market, analysis, finance, management, decision making, survival, growth.	KZ	2
17MVD	Marketing in Transportation General principles of the marketing applied in transportation. Marketing, marketing research, macroworld, microworld, markets, market positioning, products, brands, package, service, pricing, distribution channels, physical distribution, retail, wholesale, promotion, advertising, segmentation, placement, action plan.	Z,ZK	2
17ODS	Optimization on Transportation Networks Introduction to optimization and heuristic methods, metaheuristic methods, the history of optimization. Lagrangean approach, assignment problem - Hungarian method, minimum weighted matching, Little's algorithm, vehicle routing problem - an extension of TSP, heuristic solution approaches to vehicle routing problem, local search techniques, Tabu Search, location problems - heuristic algorithms, genetic algorithms and extensions of genetic algorithms.	Z,ZK	3
17PDO	Designing of Public Transport Services Transport planning, demand elasticity. Strategy and hierarchical planning of public transport system. Line network planning, concept of offer. Integrated periodic timetable. Planning process of long-distance and regional transport. Optimised number of rolling-stock, circulation plan of rolling-stock, rolling-stock strategy. Public service liability for various segments. Harmony of particular long-term plans. Controlled competition. Case studies.	KZ	3
17PZL	Carriage and Forwarding Carriage, forwarding, economy, transport, supply, storage, warehouses, goods, passengers, insurance, distribution, customs.	Z,ZK	3
17RIP	Project Management Project, influences, pressures and influences. Entrepreneurial plan and capital decision making. Marketing, break-even point assessment. Project management and his characters. Organizational structures in project management. Feasibility study. Capital and operational costs assessment. Process of choosing optimal variant. Cost Benefit Analysis. Models of project financing. Life cycle of project. Financial anal. of capital projects. Project risks.	KZ	2
17TAC	Tariffs and Prices in Transport Transport and division of labour. Costs in transport. External costs. Financing of traffic in transport. Prices and tariffs. Tariffs of railway transport. Tariffs of road transport. Tariffs of air and water contract. Transport market. Service arrangement in public interest. Pricing policy history. Pricing in the EU.	Z	1
17TCHR	Tourist Trade Techniques Development and importance of the tourist trade, summary of tourist trade services with more detailed analysis of transport services and means of transport in the air, water and land (rail and road) transport.	Z	1
17TDL	Transport Technology and Logistics Basic terms in transport technology and logistics. Particular steps of transport planning. Quantification of carriage relations. Line planning. Timetabling. Planning in passenger and freight transport. Organisation of traffic in each transport means. Technological factors from the point of view of operator and client. Organisation of public city transport. Logistic technologies and their application using various transport means.	Z,ZK	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
17X31	Project 1	Z	2
17X32	Project 2	Z	2
17X33	Project 3	Z	2
17Y1AF	Alternative Forms of Transportation Project Financing 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.	KZ	2
17Y1DZ	Transported Commodities Cognization Useful features. Quality. Testing. Standardization. Features relevant for the transport. Packing. Stress. Protection of goods and damage prevention during the carriage. Optimization of the choice and effective transport means utility.	KZ	2
17Y1EV	Public Sector Economy Economic and financial theory of public sector, public choice theory, externalities, decisions about public finance allocation, economic assesment of public projects (CBA, MCA, CEA), tax system of the CR, state budget, management of public projects a their economic efficiency assessment, way of elaboration of PPP projects, funding from EU funds, program HDM-4.	KZ	2
17Y1LL	Logistics of Passenger and Freight Air Transport 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.	KZ	2
17Y1ND	Maritime Transportation 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.	KZ	2
17Y1OF	Personal Finance 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).	KZ	2
17Y1PM	Personnel Management Human sources, work group, man as personality, planning, choice, evaluation and education of human sources, work adaptation, teamwork, intercultural communication.	KZ	2
17Y1ST	Titan Simulation 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.	KZ	2
18KIAD	Kinematics and Dynamics Motion along a line, motion along a curve. Kinematics of rigid plane, kinematics of rigid body. Point mass kinematics, system of point masses. Point mass dynamics and system of point masses, equation of motion. Method of Newton. Principle of D'Alembert. Free and forced vibration with one degree of freedom. Viscous damping. Impact theory. Introduction to the solution of vibration with multiple degrees of freedom.	Z,ZK	2
18MRI1	Materials 1 Crystal structure. Basics of thermodynamics of metals and their alloys. Balanced binary diagrams. Alloys of iron with carbon. Deterioration of solid solutions. Heating processing of steel and cast irons. Physical features. Mechanical features. Dephctostopic testing. Corosion.	Z,ZK	3

18MRI2	Materials 2	KZ	2
Fundamental concepts, notions. The main materials groups. Semiconductors. Polymers. Special types of steel. Properties and application of the composite materials.			
18PZP	Elasticity and Strength	Z,ZK	3
Tension and compression. Bending of beam. Shear stress during bending of beam. Design and analysis of cross section of beam. Design of riveted, bolted and welded joint of structure. Analysis of deflection curve of beam. Torsion of circle cross section. Combined loading. Stability of compressed bar and buckling. Beam on elastic foundation. Strength analysis.			
18ST	Statics	Z,ZK	3
General system of forces. Calculation of reactions of mass objects and compound systems. Assessment of internal forces on statically determinate beam and simple framework. Principle of virtual works. Kinematic method for calculation of reactions of statically determinate systems. Determination of axial forces in truss construction, method of joints and method of sections. Geometry of cross sections. Plane fiber polygons and catenary cables.			
18TTED	Creation of Technical Documentation	KZ	2
Technical standards, international standardization, types of technical drawings, representation of technical objects, technical diagrams and charts, dimensional and geometrical accuracy, arrangement of drawing sheets, types of schemes and their creation.			
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.			
18Y1D1	Dynamics of Routes and Vehicles 1	KZ	2
Theory and analysis of vibration of multimass systems. Dynamical model of vehicle and interaction with transport structure. Assessment of structure vibration and allowable criteria. Vibroisolation and absorbers of dynamical effects. Methods of experimental dynamics. FEM in structure dynamics.			
18Y1EV	Experimental Methods and Numerical Modelling	KZ	2
Physical properties measured in structural mechanics and dynamics. Principles of strain gauge measurement. Theory of photoelasticity, experimental methods in structural dynamics. Basic principles of numerical methods in structural mechanics and dynamics. Finite element method in statics and dynamics. Geometry development, discretization to elements, types of structural elements. Boundary conditions. Material models. Solution of problems.			
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.			
18Y1SN	Statically Nondetermined Structures	KZ	2
Deformations of the beam element, virtual work. Strength method. Frame analysis by strength method. Deformation method. Frame analysis by deformation method. Simple planar grid. Beam on elastic Winkler's foundation. Calculation beam on elastic foundation. Basement of the mathematical elasticity. Calculation of walls. Calculation of plates. Cylindrical shells. Examples of calculations.			
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.			
20SSA	Systems Analysis	Z,ZK	3
Systems identification. Typical tasks of systems analysis: on the interface, routes in system, decomposition and integration, on systems feedback. Capacity tasks, process analysis. Task about behaviour, aim behaviour, the genetic code, architecture and identity of systems. Fundamentals of technical cybernetics, stability and reliability of systems.			
20UIS	Introduction to ITS	Z,ZK	3
Intelligent Transport Systems (ITS), their objectives and vision. ITS in the world, in Europe and in the Czech Republic. Architecture of ITS and the role of standardization. Information and navigation systems. ITS in road, rail and combine transport. Design of ITS, organization, preparation and implementation of the project. Current projects in the Czech Republic.			
20X31	Project 1	Z	2
20X32	Project 2	Z	2
20X33	Project 3	Z	2
20Y1IC	Human Machine Interaction	KZ	2
Interaction of human-system. Methods and procedures for detecting decrease in attention. Used software and hardware tools. Bio-feedback, EEG measurements.			
20Y1K	Cybernetics	KZ	2
Fundamentals of information theory, dynamic systems, the principle of feedback, logical systems. Finite automata as a special case of dynamical systems. Relations between languages and automata.			
20Y1NS	Neural Networks	KZ	2
The basic structure and function of human brain and its main functional blocks and building elements - neurons. Models of neurons, modelling their networks and the basic paradigms of artificial neural networks.			
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).			
20Y1PO	Weather, Air Quality and Transportation	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.			
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.			
20Y1TD	Telematics Databases	KZ	2
Issue of telematics databases, work with OpenStreetMap layer, use of Linux OS and PostgreSQL with PostGIS extension, real traffic data.			
20Y1TE	Technology of Electronic Systems	KZ	2
Characteristics of the technological process, the relation of the design, construction and technology. General scheme of technological process. Principles and characteristics of basic electronic elements. Basic technology of integrated circuits. Synthesis of integrated circuits. Higher levels of technology components. Measurement, diagnostics, reliability. Operational aspects of electronic systems.			
21X31	Project 1	Z	2

21X32	Project 2	Z	2
21X33	Project 3	Z	2
21Y1LM	Aviation Meteorology Structure of atmosphere. Vertical stratification. Pressures QNH, QFE, QFF, QME. Instability. Atmospheric fronts. Atmospheric precipitation, origin & categorisation. Turbulence. Forces producing wind. Cyclone and anticyclone. Gradient wind. Geostrophical and geocyclostrophical wind. Visibilities in air transport. Dangerous meteorological aspects. Meteorological maps. Climatology. Circulation. Intertropical front. Meteorological information.	KZ	2
21Y1LR	Radio Technology in Aviation 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.	KZ	2
21Y1PU	Aircraft Maintenance Technology Basics of aircraft maintenance technology, legislation, aircraft release into operation, safety, equipment.	KZ	2
21ZLD	Introduction to Air Transport Air transport as a component of complex transport system. International status of civil aviation. International organizations in Europe and worldwide. Characteristics of air transport. Commercial air transport. Technical operations of aeroplanes.	KZ	2
22UN	Traffic Accidents Introduction Traffic accident as a physical process, systematic submission, vehicle x human x infrastructure interaction, accidents statistics, aircraft accidents, accidents on railways, accidents on waterways, road traffic accidents, other aspects, accidental prevention.	Z	2
22X31	Project 1	Z	2
22X32	Project 2	Z	2
22X33	Project 3	Z	2
23KM	Crisis Management Theory and legal frame of crisis management with direction to Rescue system (IZS). After introduction to safety domain, there are terms and knowledge on theory and position of crisis management and its targets, IZS-crisis management-crisis planning and basic legislation. Practical part is concentrated to responsibility matrix compilation.	KZ	2
23X31	Project 1	Z	2
23X32	Project 2	Z	2
23X33	Project 3	Z	2

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