

Study plan

Name of study plan: MED bak.komb.10/11

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 combined

Required credits: 180

Elective courses credits: 0

Sum of credits in the plan: 180

Note on the plan:

Name of the block: Compulsory courses

Minimal number of credits of the block: 133

The role of the block: Z

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

Name of the group: 1.sem.MED bak.komb.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 11 courses

Credits in the group: 30

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
13E	Economics	Z,ZK	3	2+1	Z	z
11GIE	Geometry Šárka Vorá ová, Pavel Provinský, Old ich Hykš, Vít Malinovský Old ich Hykš Šárka Vorá ová (Gar.)	KZ	3	2P+2C+12B	Z	z
14KSP	Constructing with Computer Aid Lukáš Svoboda, Drahomír Schmidt, Martin Brumovský, Radek Kratochvíl, Vladimír Douda, Michal Mlada, Jan Vogl, Jan Zelenka Lukáš Svoboda	KZ	2	0P+2C+8B	Z	z
11LA	Linear Algebra Pavel Provinský, Martina Be vá ová, Lucie Kárná Martina Be vá ová Martina Be vá ová (Gar.)	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
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
21ZLDK	Introduction to Air Transport	KZ	3	8		z

Characteristics of the courses of this group of Study Plan: Code=1.S.BKMED 10/11 Name=1.sem.MED bak.komb.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.			
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.			
21ZLDK	Introduction to Air Transport	KZ	3
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.BKMED 10/11

Name of the group: 2.sem.MED bak.komb.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 11 courses

Credits in the group: 30

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) <i>Tutors, authors and guarantors (gar.)</i>	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	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
17TDLK	Transport Technology and Logistics	Z,ZK	4	12	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.BKMED 10/11 Name=2.sem.MED bak.komb.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 acquirement 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.			
17TDLK	Transport Technology and Logistics	Z,ZK	4
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.			
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.BKMED 11/12

Name of the group: 3.sem.MED.bak.komb.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>Josef Kocourek, Milan Dont</i>	Z,ZK	3	2P+1C+8B	Z	z
12PPOK	Designing Roads, Highways and Motorways <i>Petr Šatra, Jiří arský, Tomáš Paďelík, Petr Kumpošt</i>	KZ	3	1P+2C+10B	Z	z
18PZP	Elasticity and Strength <i>Ondřej Jiroušek, Josef Jíra, Petr Koudelka, Jitka ezni ková, Daniel Kytý, Jan Vyšehlík, Tomáš Doktor, Jan Šleichrt, Radim Dvořák</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.BKMED 11/12 Name=3.sem.MED.bak.komb.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 post, principle of telecommunication signal transmission, solving of telecommunication networks, modulating methods, multimedial 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. Legislature.			
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 elementar methods: method of consecutive reduction, unloaded voltage divider, current divider. Transfiguration star-triangel and principle of superposition in direct current circuits.			

Code of the group: 5.S.BKMED 12/13

Name of the group: 5.sem.MED bak.komb.12/13

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
14DB	Database Systems	KZ	2	0+2	Z	z
17DNV	Transportation of Dangerous Goods	KZ	2	2+0	Z	z
13FIF	Finances and Financing	KZ	2	2+0	Z	z
13KM	Crisis Management	KZ	2	2+0	Z	z
17LOS	Logistic Systems	Z,ZK	3	2+1	Z	z
13MSTP	Small and Medium Enterprise	KZ	2	2+0	Z	z
17PDO	Designing of Public Transport Services	KZ	3	2+1	Z	z
13TCHR	Tourist Trade Techniques	Z	1	2+0	Z	z
17TGA	Graph Theory and its Applications in Transport <i>Alena Rybíková, Denisa Mocková, Dušan Teichmann</i>	Z,ZK	4	2+2+1+2	Z	z

Characteristics of the courses of this group of Study Plan: Code=5.S.BKMED 12/13 Name=5.sem.MED bak.komb.12/13

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.			
13FIF	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.			
13KM	Crisis Management	KZ	2
Extraordinary events in transport. Crisis states. Authorities of crisis management of the state. Crisis and emergency planning. Precautions of economic mobilization of the state. Use of state material reserves. Organization conditions for crisis states treatment. Technical means for elimination of results of extraordinary events. Protection and renewal of transport infrastructure, ensuring of operation. Information systems of crisis management.			
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.			
13MSTP	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.			
13TCHR	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.			
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.			

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

Name of the group: 5.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
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.BKMED VÝB R 12/1 Name=5.sem.MED výb r p edm t 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.BKMED 12/13

Name of the group: 6.sem.MED bak.komb. 12/13

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
17DAS	Transportation and Communication Law	Z	1	2+0	L	z
17DU	Public Transport Service in a Territory	KZ	2	2+0	L	z
13ERP	Company Economy and Management	Z,ZK	3	2+1	L	z
14ISYS	Information Systems	KZ	2	2+0	L	z
13KS	Quality of Transport and Telecommunication Systems	KZ	2	2+0	L	z
13MPD	Management of Techonology Systems of Land Transport	Z,ZK	3	2+1	L	z
13MR	Managerial Decision Making	KZ	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
13TAC	Tariffs and Prices in Transport	Z	1	2+0	L	z

Characteristics of the courses of this group of Study Plan: Code=6.S.BKMED 12/13 Name=6.sem.MED bak.komb. 12/13

17DAS	Transportation and Communication Law	Z	1	Transportation and communication law - railway, road transport, ropeway, water road, air transport, telecommunication, post, patent.		
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.		
13ERP	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.		
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.		
13KS	Quality of Transport and Telecommunication Systems	KZ	2	Quality, systems, company, customer, norms, assessment, methods, indicators, satisfaction, loyalty.		
13MPD	Management of Techonology 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.		
13MR	Managerial Decision Making	KZ	3	Decision making, rationality, process, state of the world, CPM, PERT, trees, group, certainty, risk, uncertainty, preference.		

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.			
13TAC	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: Compulsory courses in the program

Minimal number of credits of the block: 23

The role of the block: P

Code of the group: 4.S.BKMED 11/12

Name of the group: 4.sem.MED bak.komb.11/12

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) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
17DPAS	Transport Policy and Strategy	KZ	2	2+0	L	P
14EAT	Economic Analyses in Spreadsheets Programs Environment	KZ	2	0+2	L	P
17EM	Management Science	KZ	2	2+0	L	P
13EDTP	Economy and Management of Transport and Telecommunication Processes	Z,ZK	3	2+1	L	P
13HG	Economic Geography	Z	2	2+0	L	P
18KIAD	Kinematics and Dynamics	Z,ZK	2	2+1	L	P
13MVD	Marketing in Transportation	Z,ZK	2	2+1	L	P
17MEKA	Methods of Economics Analysis <i>Martina Vitteková</i>	KZ	2	2P+0C	Z	P
11MSP	Modeling of Systems and Processes <i>Bohumil Ková</i>	Z,ZK	4	2P+0C+1B	L	P
17RIP	Project Management	KZ	2	2+0	L	P
14WS1	Webdesign With Web Standards 1	KZ	2	0+2	L	P

Characteristics of the courses of this group of Study Plan: Code=4.S.BKMED 11/12 Name=4.sem.MED bak.komb.11/12

17DPAS	Transport Policy and Strategy	KZ	2
Goals, principles and tools of the transport policy. Development of transport policy of the EU and the R. Decreasing negative impacts on environment. Sustainable development strategy. Transport enterprise and access to transport market. Transport in regions. Public service obligation in transport. Transport infrastructure and vehicles, financing. Safety and reliability in transport. Relations of individual transport modes.			
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.			
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.			
13EDTP	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.			
13HG	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.			
13MVD	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.			
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.			
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.			

Name of the block: Compulsory elective courses

Minimal number of credits of the block: 12

The role of the block: PV

Code of the group: W1-B 11/12

Name of the group: PVP bak.komb. od 11/12

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

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

Credits in the group: 12

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
17W1AF	Alternative Forms of Transportation Project Financing	KZ	4	8	Z	PV
17W1BB	Banks and Banking	KZ	4	8	Z	PV
15W1BO	Work Safety and Health Protection	KZ	4	8	L	PV
15W1DU	Art History and Society	KZ	4	8	Z	PV
15W1DZ	History of Railway	KZ	4	8	L	PV
17W1DZ	Transported Commodities Cognization	KZ	4	8	L	PV
13W1EA	Economic - Energetic Analysis of Land Transport	KZ	4	8	Z	PV
13W1EV	Public Sector Economy	KZ	4	8	Z	PV
17W1EV	Public Sector Economy	KZ	4	8B	Z	PV
15W1EH	European Integration within Historical Context	KZ	4	8	Z	PV
15W1HD	History of City Public Transport	KZ	4	8	Z	PV
15W1HE	Work Hygiene and Ergonomics in Traffic	KZ	4	8	Z	PV
17W1LL	Logistics of Passenger and Freight Air Transport	KZ	4	8B	L	PV
11W1MM	Mathematical Models in Economy	KZ	4	8	Z	PV
17W1ND	Maritime Transportation	KZ	4	8	Z	PV
13W1PM	Personal Management	KZ	4	8	L	PV
13W1PD	The Participation of Transport in Tourist Trade Management	KZ	4	8	L	PV
16W1PV	Operation, Construction and Maintenance of Vehicles	KZ	4	8	L	PV
16W1RV	Railroad Vehicles Driving	KZ	4	8	L	PV
13W1SM	MESE Simulation	KZ	4	8	Z	PV
16W1TJ	Technological Quality Aspects	KZ	4	8	Z	PV
16W1TR	Theory of Railroad Vehicle Driving	KZ	4	8	Z	PV
16W1TZ	Transporting Devices	KZ	4	8	L	PV
12W1VC	Waterways and shipping	KZ	4	8	Z	PV
12W1VD	Water Transport and Transportation	KZ	4	8	L	PV
16W1ZL	Vehicle Testing, Legislation and Construction	KZ	4	8	Z	PV

Characteristics of the courses of this group of Study Plan: Code=W1-B 11/12 Name=PVP bak.komb. od 11/12

17W1AF	Alternative Forms of Transportation Project Financing	KZ	4
It 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 financing.			
17W1BB	Banks and Banking	KZ	4
Banks and banking system. Balance sheet, income statement, bank's capital and its functions. Banking risks. Banking products. Interest types, pay-off and loan securing, financial loan products. Banking deposit products. Banking payment-clearing products. Financial intermediation, open-end and closed-end funds, collective investment schemes. Central bank and its role. Bank regulation and supervision. International banking.			
15W1BO	Work Safety and Health Protection	KZ	4
Fundamental legislature, 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.			
15W1DU	Art History and Society	KZ	4
Aesthetics and its basic concepts. Art history: definitions, terminology, division into periods. Architecture, fine arts, design in Europe and America in the course of centuries. Situation in Central Europe, Czechoslovakia, the Czech Republic. Art Nouveau, Cubism, Postmodernism in industrial buildings and transportation facilities. Stations, bridges, embankments, sluices etc. Aesthetics and construction work today. Design of transport vehicles.			
15W1DZ	History of Railway	KZ	4
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, development of long-distance train connections, railway lines construction, railway accidents, railway junctions. Study trips and projections.			
17W1DZ	Transported Commodities Cognization	KZ	4
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.			
13W1EA	Economic - Energetic Analysis of Land Transport	KZ	4
Vehicle traction systems, traction-energetic properties, laws of vehicle motion, assessment of energy demands, traction-energetic conceptions, technical, economical and social aspects.			
13W1EV	Public Sector Economy	KZ	4
Summary of basic economic findings, public goods - definition, public sector domains, state budget, taxes, public goods and externalities, externalities in transportation and their treatment, methods of assessment of public projects, transport projects and their funding, benefits of transport projects, the assessment of transport projects by the CBA method, HDM-4, CSHS.			
17W1EV	Public Sector Economy	KZ	4
Economic and financial theory of public sector, public choice theory, externalities, decisions about public finance allocation, economic assesment of public projects (CBA, MCA, CEA), tax system of the CR, state budget, management of public projects a their economic efficiency assessment, way of elaboration of PPP projects, funding from EU funds, program HDM-4.			
15W1EH	European Integration within Historical Context	KZ	4
Versailles system, formation of new states. Europe and the powers, League of Nations. European policy in the 1920s. Fascism, nacism, communism. Little Entente, its principles and goals. Europe after Hitler's getting to power, system of bilateral agreements. Decline of the LN. Rearrangement of powers during WWII. Cold war and its consequences for Europe. New quality of French-German relationship - a driving power of starting European integration.			
15W1HD	History of City Public Transport	KZ	4
History of city public transport in the world; development of tram, bus and trolley-bus systems. History of transport networks in the world; current trends and development 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.			
15W1HE	Work Hygiene and Ergonomics in Traffic	KZ	4
Basic knowledge of occupational hygiene and ergonomics, and their application in transport. Working environment factors, and the influence of these factors on health of workers. Creation and protection of working conditions that do not damage public health. Mutual links: man-machine-environment. Adaptation of technology to possibilities and skills of a man. Practical examples from the field of transportation; relevant legislature.			
17W1LL	Logistics of Passenger and Freight Air Transport	KZ	4
Logistics airline passenger and cargo. Aircraft and airport terminals for passenger and cargo transport. Airlines in terms of logistics systems. Aerial transport process passengers and air cargo. Information systems in air transport. Global distribution systems.			
11W1MM	Mathematical Models in Economy	KZ	4
Linear models subjected to linear constraints leading to linear programming. Models of net analysis, storage models, queue lengths models. Theory of reliability. Dynamical programming, convex optimisation tasks.			
17W1ND	Maritime Transportation	KZ	4
History and importance of the maritime transportation, theoretical discipline in maritime transportation, seafaring vessels, maritime ports and their utilization, inland logistic centre and maritime ports, transport corridors and link by maritime, river and rail transport I and II, global maritime corridors, logistics of maritime transportation, maritime transportation and smart containers, ITS in maritime transport.			
13W1PM	Personal Management	KZ	4
Basic overview of leadership issue from the viewpoint of an employee as well as a manager. The accent at the experience of basic situations through a simulation game. Systemic approach to the personal management, the assessment as a process, SWOT analysis, basic principles of personal management, theory and practice of motivation, managerial leadership styles.			
13W1PD	The Participation of Transport in Tourist Trade Management	KZ	4
Tourist trade, transport, typology, market, marketing mix, transport service providers, contract cooperation, reservation systems, transport valuables, standard air carriers, low cost air carriers, IATA, ICAO, road, water, rail transport.			
16W1PV	Operation, Construction and Maintenance of Vehicles	KZ	4
Methods of vehicle production. Vehicle maintenance. Vehicle diagnostics. Maintenance and repair plans. Engine maintenance and emission measurement. Transmission mechanism. General principles of engine diagnostics.			
16W1RV	Railroad Vehicles Driving	KZ	4
Electric circuits in railroad vehicles. Railroad vehicle parametres regulation. Servicing and operation of the railroad vehicles. Rail traction technology. Solution of emergency situations. Searching and solving faults.			
13W1SM	MESE Simulation	KZ	4
Management game simulating corporate decision making. Groups of students produce the same product, give the volume of available production capacity, plan budgets for marketing, research and development.			
16W1TJ	Technological Quality Aspects	KZ	4
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.			

16W1TR	Theory of Railroad Vehicle Driving Legislation in railroad transportation. Technical condition of railroad vehicles and responsibility for their condition. Railroad traffic regulations. Railroad traffic safety. Signal systems. Radiocommunication system. Powering system. Power distribution.	KZ	4
16W1TZ	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	4
12W1VC	Waterways and shipping European waterway net, waterways parameters, ports and transshipment points, advantages and disadvantages of water transport, regulations of ship operation and waterways, shipping net in the Czech Republic and European countries, waterways authorities, investment in water infrastructure.	KZ	4
12W1VD	Water Transport and Transportation	KZ	4
16W1ZL	Vehicle Testing, Legislation and Construction Vehicle construction, aggregate computing, driving resistance, building and parameters of traction, constructional arrangement of personal cars, trucks, buses, motorbikes, legislation in the EU and in the world, creation of technical legislation, testing methods, vehicle tests, accelerated tests, mathematical modelling in testing.	KZ	4

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

Characteristics of the courses of this group of Study Plan: Code=JZ-B-3.4 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 pilot. Focus on improvement in perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral and written form. Technical texts and their features; terminology.	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 - pilot. Focus on improvement in perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral and written form. Technical texts and their features; terminology.	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	Z,ZK	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JZ3R	Foreign Language - Russian 3	Z	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JZ4R	Foreign Language - Russian 4	Z,ZK	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JZ3S	Foreign Language - Spanish 3	Z	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JZ4S	Foreign Language - Spanish 4	Z,ZK	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			

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, Marie Michlová, Markéta Vojanová, Jitka He manová, Marek Tomek, Lenka Monková, Markéta Olehlová, Peter Morpuss, Jan Feit</i>	Z	3	OP+4C+10B		J
15JZ2A	Foreign Language - English 2 <i>Eva Rezlerová, Marie Michlová, Markéta Vojanová, Jitka He manová, Marek Tomek, Lenka Monková, Markéta Olehlová, Peter Morpuss, Jan Feit</i>	Z,ZK	3	OP+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
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.			
11FY1	Physics 1	Z,ZK	4
Kinematics, particle dynamics, dynamics of particle systems and rigid body. Continuum mechanics, thermodynamics, electric field, directed electric current.			
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.			
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.			
11LA	Linear Algebra	Z,ZK	3
Vector spaces (linear combinations, linear independence, dimension, basis, coordinates). Matrices and operations. Systems of linear equations and their solvability. Determinants and their applications. Scalar product. Similarity of matrices (eigenvalues and eigenvectors). Quadratic forms and their classification.			
11MSP	Modeling of Systems and Processes	Z,ZK	4
Mathematical methods and algorithms as a basis for system analysis. Methods for modelling and evaluating the systems in continuous and discrete time domain. Laplace transform, Z-transform, and the recursive algorithms in solution of differential and difference equations, as an instrument for system description. Practical use of technical computing environment.			
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.			
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 R ³ , application of integral calculus in physics.			
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.			
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.			
11W1MM	Mathematical Models in Economy	KZ	4
Linear models subjected to linear constraints leading to linear programming. Models of net analysis, storage models, queue lengths models. Theory of reliability. Dynamical programming, convex optimisation tasks.			
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.			
12W1VC	Waterways and shipping	KZ	4
European waterway net, waterways parameters, ports and transshipment points, advantages and disadvantages of water transport, regulations of ship operation and waterways, shipping net in the Czech Republic and European countries, waterways authorities, investment in water infrastructure.			
12W1VD	Water Transport and Transportation	KZ	4
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.			
13EDTP	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.			
13ERP	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.			
13FIF	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.			
13HG	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.			
13KM	Crisis Management	KZ	2
Extraordinary events in transport. Crisis states. Authorities of crisis management of the state. Crisis and emergency planning. Precautions of economic mobilization of the state. Use of state material reserves. Organization conditions for crisis states treatment. Technical means for elimination of results of extraordinary events. Protection and renewal of transport infrastructure, ensuring of operation. Information systems of crisis management.			
13KS	Quality of Transport and Telecommunication Systems	KZ	2
Quality, systems, company, customer, norms, assessment, methods, indicators, satisfaction, loyalty.			
13MPD	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.			
13MR	Managerial Decision Making	KZ	3
Decision making, rationality, process, state of the world, CPM, PERT, trees, group, certainty, risk, uncertainty, preference.			
13MSTP	Small and Medium Enterprise	KZ	2
SME, design, plan, market, analysis, finance, management, decision making, survival, growth.			
13MVD	Marketing in Transportation	Z,ZK	2
General principles of the marketing applied in transportation. Marketing, marketing research, macroworld, markets, market positioning, products, brands, package, service, pricing, distribution channels, physical distribution, retail, wholesale, promotion, advertising, segmentation, placement, action plan.			
13TAC	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.			
13TCHR	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.			
13W1EA	Economic - Energetic Analysis of Land Transport	KZ	4
Vehicle traction systems, traction-energetic properties, laws of vehicle motion, assessment of energy demands, traction-energetic conceptions, technical, economical and social aspects.			
13W1EV	Public Sector Economy	KZ	4
Summary of basic economic findings, public goods - definition, public sector domains, state budget, taxes, public goods and externalities, externalities in transportation and their treatment, methods of assessment of public projects, transport projects and their funding, benefits of transport projects, the assessment of transport projects by the CBA method, HDM-4, CSHS.			
13W1PD	The Participation of Transport in Tourist Trade Management	KZ	4
Tourist trade, transport, typology, market, marketing mix, transport service providers, contract cooperation, reservation systems, transport valuables, standard air carriers, low cost air carriers, IATA, ICAO, road, water, rail transport.			
13W1PM	Personal Management	KZ	4
Basic overview of leadership issue from the viewpoint of an employee as well as a manager. The accent at the experience of basic situations through a simulation game. Systemic approach to the personal management, the assessment as a process, SWOT analysis, basic principles of personal management, theory and practice of motivation, managerial leadership styles.			
13W1SM	MESE Simulation	KZ	4
Management game simulating corporate decision making. Groups of students produce the same product, give the volume of available production capacity, plan budgets for marketing, research and development.			
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 acquirement 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, multimedial 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.			
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-triangel and principle of superposition in direct current circuits.			
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 properties. Flow charts for algorithms drawing. Mathematic and logic ordering algorithms incl. functions and procedures. Work with MS-Excel - tables, graphs, calculations, functions.			
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.			
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.			
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.			
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.			
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.			
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.			
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.			
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.			

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.			
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.			
15JZ3A	Foreign Language - English 3	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 pilot. Focus on improvement in perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral and written form. Technical texts and their features; terminology.			
15JZ3F	Foreign Language - French 3	Z	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
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 - pilot. Focus on improvement in perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral and written form. Technical texts and their features; terminology.			
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.			
15W1BO	Work Safety and Health Protection	KZ	4
Fundamental legislature, 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.			
15W1DU	Art History and Society	KZ	4
Aesthetics and its basic concepts. Art history: definitions, terminology, division into periods. Architecture, fine arts, design in Europe and America in the course of centuries. Situation in Central Europe, Czechoslovakia, the Czech Republic. Art Nouveau, Cubism, Postmodernism in industrial buildings and transportation facilities. Stations, bridges, embankments, sluices etc. Aesthetics and construction work today. Design of transport vehicles.			
15W1DZ	History of Railway	KZ	4
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, development of long-distance train connections, railway lines construction, railway accidents, railway junctions. Study trips and projections.			
15W1EH	European Integration within Historical Context	KZ	4
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.			
15W1HD	History of City Public Transport	KZ	4
History of city public transport in the world; development of tram, bus and trolley-bus systems. History of transport networks in the world; current trends and development 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.			
15W1HE	Work Hygiene and Ergonomics in Traffic	KZ	4
Basic knowledge of occupational hygiene and ergonomics, and their application in transport. Working environment factors, and the influence of these factors on health of workers. Creation and protection of working conditions that do not damage public health. Mutual links: man-machine-environment. Adaptation of technology to possibilities and skills of a man. Practical examples from the field of transportation; relevant legislature.			

16UDDM	Introduction to Transportation and Manipulation Technics 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.	ZK	2
16W1PV	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	4
16W1RV	Railroad Vehicles Driving Electric circuits in railroad vehicles. Railroad vehicle parameters regulation. Servicing and operation of the railroad vehicles. Rail traction technology. Solution of emergency situations. Searching and solving faults.	KZ	4
16W1TJ	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	4
16W1TR	Theory of Railroad Vehicle Driving Legislation in railroad transportation. Technical condition of railroad vehicles and responsibility for their condition. Railroad traffic regulations. Railroad traffic safety. Signal systems. Radiocommunication system. Powering system. Power distribution.	KZ	4
16W1TZ	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	4
16W1ZL	Vehicle Testing, Legislation and Construction Vehicle construction, aggregate computing, driving resistance, building and parameters of traction, constructional arrangement of personal cars, trucks, buses, motorbikes, legislation in the EU and in the world, creation of technical legislation, testing methods, vehicle tests, accelerated tests, mathematical modelling in testing.	KZ	4
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
17DPAS	Transport Policy and Strategy Goals, principles and tools of the transport policy. Development of transport policy of the EU and the R. Decreasing negative impacts on environment. Sustainable development strategy. Transport enterprise and access to transport market. Transport in regions. Public service obligation in transport. Transport infrastructure and vehicles, financing. Safety and reliability in transport. Relations of individual transport modes.	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
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
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
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
17TDLK	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	4
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
17W1AF	Alternative Forms of Transportation Project Financing It 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 financing.	KZ	4

17W1BB	Banks and Banking	KZ	4
Banks and banking system. Balance sheet, income statement, bank's capital and its functions. Banking risks. Banking products. Interest types, pay-off and loan securing, financial loan products. Banking deposit products. Banking payment-clearing products. Financial intermediation, open-end and closed-end funds, collective investment schemes. Central bank and its role. Bank regulation and supervision. International banking.			
17W1DZ	Transported Commodities Cognization	KZ	4
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.			
17W1EV	Public Sector Economy	KZ	4
Economic and financial theory of public sector, public choice theory, externalities, decisions about public finance allocation, economic assesment of public projects (CBA, MCA, CEA), tax system of the CR, state budget, management of public projects a their economic efficiency assessment, way of elaboration of PPP projects, funding from EU funds, program HDM-4.			
17W1LL	Logistics of Passenger and Freight Air Transport	KZ	4
Logistics airline passenger and cargo. Aircraft and airport terminals for passenger and cargo transport. Airlines in terms of logistics systems. Aerial transport process passengers and air cargo. Information systems in air transport. Global distribution systems.			
17W1ND	Maritime Transportation	KZ	4
History and importance of the maritime transportation, theoretical discipline in maritime transportation, seafaring vessels, maritime ports and their utilization, inland logistic centre and maritime ports, transport corridors and link by maritime, river and rail transport I and II, global maritime corridors, logistics of maritime transportation, maritime transportation and smart containers, ITS in maritime transport.			
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. Princlce 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.			
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.			
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.			
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.			
21ZLDK	Introduction to Air Transport	KZ	3
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.			
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.			

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