

# Study plan

## Name of study plan: MED bak.komb.13/14

Faculty/Institute/Others:

Department:

Branch of study guaranteed by the department: Welcome page

Garantor of the study branch: prof. Ing. Tomáš Zelinka, CSc.

Program of study: Technology in Transportation and Telecommunications

Type of study: Bachelor combined

Required credits: 180

Elective courses credits: 0

Sum of credits in the plan: 180

Note on the plan:

Name of the block: Compulsory courses

Minimal number of credits of the block: 156

The role of the block: Z

Code of the group: 1.S.BKMED 13/14

Name of the group: 1.sem.MED bak.komb.13/14

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
17E	<b>Economics</b>	Z,ZK	3	2+1	Z	z
11GIE	<b>Geometry</b> Oldřich Hykš, Šárka Voráčová, Pavel Provinský	KZ	3	2P+2C	Z	z
14KSP	<b>Constructing with Computer Aid</b> Filip Müller, Martin Brumovský, Lukáš Kozel, Radek Kratochvíl, Drahomír Schmidt, Lukáš Svoboda, Monika Stambolidis	KZ	2	0P+2C	Z	z
11LA	<b>Linear Algebra</b> Pavel Provinský, Martina Bečvářová, Lucie Kárná, Jan Přikryl	Z,ZK	3	2P+1C	Z	z
11MTA	<b>Mathematical Analysis</b>	Z,ZK	4	2+2	Z	z
18MRI1	<b>Materials 1</b>	Z,ZK	3	2+1	Z	z
18TTED	<b>Creation of Technical Documentation</b>	KZ	2	2+1	Z	z
12ZADI	<b>Introduction to Transportation Engineering</b>	Z,ZK	3	2+1	Z	z
14ZINF	<b>Fundamentals of Informatics</b>	KZ	2	0+2	Z	z
21ZLDK	<b>Introduction to Air Transport</b>	KZ	3	8		z
22UN	<b>Traffic Accidents Introduction</b>	Z	2	2+0	Z	z

### Characteristics of the courses of this group of Study Plan: Code=1.S.BKMED 13/14 Name=1.sem.MED bak.komb.13/14

17E	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	Orthographic and oblique projections, linear perspective. Topographic surfaces and their orthogonal projection. Differential geometry of curves - parameterization, arc of the curve, torsion and curvature, Frenet's trihedron. Kinematics - a curve as a trajectory of the motion, the velocity and acceleration of a particle moving on a curved path.
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.			
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.			
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.			

Code of the group: 2.S.BKMED 13/14

Name of the group: 2.sem.MED bak.komb. 13/14

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
17EDOT	<b>Economy, Transport, Telecommunications</b>	KZ	2	2+0	L	z
11FY1	<b>Physics 1</b> <i>Zuzana Malá, Tomáš Vitů, Marek Honců Zuzana Malá (Gar.)</i>	Z,ZK	4	2P+2C	L	z
11MVP	<b>Mathematical Analysis of Function of More Variables</b>	Z,ZK	3	2+2	L	z
18MRI2	<b>Materials 2</b>	KZ	2	2+0	L	z
11PT	<b>Probability</b>	Z	2	1+1	L	z
12PKD	<b>Rail Transport Designing</b>	Z,ZK	3	2+2	L	z
18ST	<b>Statics</b>	Z,ZK	3	2+1	L	z
14SIAP	<b>Networks and Protocols</b>	KZ	2	1+1	L	z
17TDLK	<b>Transport Technology and Logistics</b>	Z,ZK	4	12	L	z
20UIS	<b>Introduction to ITS</b>	Z,ZK	3	2+1	L	z
14UPRO	<b>Introduction to Programming</b>	KZ	2	0+2	L	z

**Characteristics of the courses of this group of Study Plan: Code=2.S.BKMED 13/14 Name=2.sem.MED bak.komb. 13/14**

17EDOT	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.			

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.			
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.			
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>Milan Dont, Josef Kocourek</i>	Z,ZK	3	2P+1C	Z	z
12PPOK	Designing Roads, Highways and Motorways <i>Jiří Čarský, Petr Šatra, Jan Gallia, Tomáš Padělek, Petr Kumpošt</i>	KZ	3	1P+2C	Z	z
18PZP	Elasticity and Strength <i>Josef Jira, Ondřej Jiroušek, Tomáš Doktor, Jan Šleichrt, Jan Šleichrt, Petr Koudelka, Petr Zlámal, Jan Vyčichl, Daniel Kytýř, ..... Ondřej Jiroušek (Gar.)</i>	Z,ZK	3	2P+1C	Z	z
11SIS	Statistics	Z,ZK	2	1+1	Z	z
20SSA	Systems Analysis	Z,ZK	3	2+1	Z	z
14ZAET	Fundamentals of Electrotechnics	KZ	2	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

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.			
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.			
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, multimedia networks and services, NGN networks.			
16UDDM	Introduction to Transportation and Manipulation Technics	ZK	2
Means of transportation and transportation systems. Principles, functions and arrangement of means of transportation. Motors and their characteristics. Water transportation. Manipulating technics. Principles of lifting machines and conveyors. Legislature.			

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

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

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

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

Credits in the group: 21

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
17EM	<b>Management Science</b>	KZ	2	2+0	L	Z
17EDTP	<b>Economy and Management of Transport and Telecommunication Processes</b>	Z,ZK	3	2+1	L	Z
17GEDS	<b>Geography of Transport Systems</b> <i>Milan Kříž, Miroslav Marada</i>	KZ	2	2P+0C+8B	L	Z
17HG	<b>Economic Geography</b>	Z	2	2+0	L	Z
18KIAD	<b>Kinematics and Dynamics</b>	Z,ZK	2	2+1	L	Z
17MVD	<b>Marketing in Transportation</b>	Z,ZK	2	2+1	L	Z
17MEKA	<b>Methods of Economics Analysis</b> <i>Otto Pastor</i>	KZ	2	2P+0C	Z	Z
11MSP	<b>Modeling of Systems and Processes</b> <i>Lucie Kármá, Jan Příkryl, Marek Honců, Bohumil Kovář, Elena Alexeeva Bohumil Kovář Bohumil Kovář (Gar.)</i>	Z,ZK	4	2P+2C+12B	L	Z
17RIP	<b>Project Management</b>	KZ	2	2+0	L	Z

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

17EM	Management Science	KZ	2
Linear Programming, graphical interpretation and solution of LP problem. Types of distribution problems, transportation problem. Models of network analysis. Models of queuing theory. Models of inventory management. Simulation models.			
17EDTP	Economy and Management of Transport and Telecommunication Processes	Z,ZK	3
Transport and telecommunication system, financing of transport infrastructure, transport policy, transport service, energy sources, public goods, externalities in transport and their treatment, assessment of public projects, CBA method, transport company, costing in transportation, transport quality.			
17GEDS	Geography of Transport Systems	KZ	2
Regional differentiation of the transport system. Sociogeographic regionalization and its relation to transport. Transport and local and regional development. Spatial interaction - theoretical and methodological framework. Mobility research - travel behavior, mode choice and the influence onto "modal-split." Modal competition. Practical use of transport-geographical analysis in transportation planning.			
17HG	Economic Geography	Z	2
Introduction of the issues, definitions and introductory concepts. World geography and its research subject. Economic geography - Europe, Asia, Africa, Australia, America, the Czech Republic. Transport geography and its research subject. Characteristics of transportation as one of the branches of the global economy. Transport systems and their location in the world. Particular transport modes as part of the economy and the world transport system.			
18KIAD	Kinematics and Dynamics	Z,ZK	2
Motion along a line, motion along a curve. Kinematics of rigid plane, kinematics of rigid body. Point mass kinematics, system of point masses. Point mass dynamics and system of point masses, equation of motion. Method of Newton. Principle of D'Alembert. Free and forced vibration with one degree of freedom. Viscous damping. Impact theory. Introduction to the solution of vibration with multiple degrees of freedom.			
17MVD	Marketing in Transportation	Z,ZK	2
General principles of the marketing applied in transportation. Marketing, marketing research, macroworld, microworld, markets, market positioning, products, brands, package, service, pricing, distribution channels, physical distribution, retail, wholesale, promotion, advertising, segmentation, placement, action plan.			
17MEKA	Methods of Economics Analysis	KZ	2
The techniques of economical analysis in the domain of analysis of dependencies, analysis and construction of time series and comparison of statistical values using differences and indices.			
11MSP	Modeling of Systems and Processes	Z,ZK	4
Mathematical methods and algorithms as a basis for system analysis. Methods for modelling and evaluating the systems in continuous and discrete time domain. Laplace transform, z-transform, and the recursive algorithms in solution of differential and difference equations, as an instrument for system description. Practical use of technical computing environment (MATLAB).			

17RIP	Project Management	KZ	2
Project, influences, pressures and influences. Entrepreneurial plan and capital decision making. Marketing, break-even point assessment. Project management and his characters. Organizational structures in project management. Feasibility study. Capital and operational costs assessment. Process of choosing optimal variant. Cost Benefit Analysis. Models of project financing. Life cycle of project. Financial anal. of capital projects. Project risks.			

Code of the group: 4.S.BKMED VÝBĚR 13/1

Name of the group: 4.sem.MED bak.komb. výběr předmětu 13/14

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

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

Credits in the group: 2

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
14EAT	Economic Analyses in Spreadsheets Programs Environment	KZ	2	0+2	L	z
14WS1	Webdesign With Web Standards 1	KZ	2	0+2	L	z

Characteristics of the courses of this group of Study Plan: Code=4.S.BKMED VÝBĚR 13/1 Name=4.sem.MED bak.komb. výběr předmětu 13/14

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

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

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

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

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

Credits in the group: 21

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
14DB	Database Systems	KZ	2	0+2	Z	z
17DNV	Transportation of Dangerous Goods	KZ	2	2+0	Z	z
17FIF	Finances and Financing	KZ	2	2+0	Z	z
23KM	Crisis Management	KZ	2	2+0	Z	z
17LOS	Logistic Systems	Z,ZK	3	2+1	Z	z
17MSTP	Small and Medium Enterprise	KZ	2	2+0	Z	z
17PDO	Designing of Public Transport Services	KZ	3	2+1	Z	z
17TCHR	Tourist Trade Techniques	Z	1	2+0	Z	z
17TGA	Graph Theory and its Applications in Transport Denisa Mocková, Alena Rybičková, Dušan Teichmann Alena Rybičková (Gar.)	Z,ZK	4	2P+2C	Z	z

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

14DB	Database Systems	KZ	2
Basic concepts of database systems, conceptual model, relational data model, the principles of normal forms, relational database design, security and integrity of data, database queries, relational algebra, SQL language, client / server, multilayer architectures, distributed database systems. Access to data via the WWW.			
17DNV	Transportation of Dangerous Goods	KZ	2
Legal measures. Kinds of hazards. Classification. Carriage by road, railways, inland waterways, air and maritime transport. Obligations of consignors, carriers, consignees and safety advisors. System of international obligatory conditions. Enumerated list of dangerous goods. Packing and marking of packages. Transport documentation. Exempted and unlimited quantity. Crew, equipment, approval, marking, operation and construction of road vehicles.			
17FIF	Finances and Financing	KZ	2
Cash flow, cost and revenue flow. Financial system functions. Financial assets. Types of financing. Company cash flow. Short-term financing instruments. Long-term financing instruments. Trading financial instruments. Banking financial instruments. Financial risk allocation instruments. Payment and hedging instruments. Loan capital. Risk capital.			
23KM	Crisis Management	KZ	2
Theory and legal frame of crisis management with direction to Rescue system (IZS). After introduction to safety domain, there are terms and knowledge on theory and position of crisis management and its targets, IZS-crisis management-crisis planning and basic legislation. Practical part is concentrated to responsibility matrix compilation.			

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.			
17MSTP	Small and Medium Enterprise	KZ	2
SME, design, plan, market, analysis, finance, management, decision making, survival, growth.			
17PDO	Designing of Public Transport Services	KZ	3
Transport planning, demand elasticity. Strategy and hierarchical planning of public transport system. Line network planning, concept of offer. Integrated periodic timetable. Planning process of long-distance and regional transport. Optimised number of rolling-stock, circulation plan of rolling-stock, rolling-stock strategy. Public service liability for various segments. Harmony of particular long-term plans. Controlled competition. Case studies.			
17TCHR	Tourist Trade Techniques	Z	1
Development and importance of the tourist trade, summary of tourist trade services with more detailed analysis of transport services and means of transport in the air, water and land (rail and road) transport.			
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 VÝBĚR 12/1

Name of the group: 5.sem.MED výběr předmětů 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 VÝBĚR 12/1 Name=5.sem.MED výběr předmětů 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 13/14

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

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

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

Credits in the group: 23

Note on the group:

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

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

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.			
17ERP	Company Economy and Management	Z,ZK	3
Company and its neighbourhood, structure of assets and liabilities, depreciation, costs, revenues and profit, break-even point, costing, inventory, financial management, investment appraisal, basics of management, organizational structures, human resources management, marketing, company strategy, business plan.			
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.			
17KS	Quality of Transport and Telecommunication Systems	KZ	2
Quality, systems, company, customer, norms, assessment, methods, indicators, satisfaction, loyalty.			
17MPD	Management of Technology Systems of Land Transport	Z,ZK	3
Structure of vehicle systems, rational assessment, decision making in the managing activity, operation-technical and economic properties, technological subsystems in the field of the road and rail transport.			
17MR	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.			
17TAC	Tariffs and Prices in Transport	Z	1
Transport and division of labour. Costs in transport. External costs. Financing of traffic in transport. Prices and tariffs. Tariffs of railway transport. Tariffs of road transport. Tariffs of air and water contract. Transport market. Service arrangement in public interest. Pricing policy history. Pricing in the EU.			

Name of the block: Compulsory elective courses

Minimal number of credits of the block: 12

The role of the block: PV

Code of the group: W1-BKMED 14/15

Name of the group: PVP bak.komb. MED 14/15

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
15W1BO	Work Safety and Health Protection	KZ	4	8	L	PV
17W1DZ	Transported Commodities Cognization	KZ	4	8	L	PV
15W1DU	Art History and Society	KZ	4	8	Z	PV
15W1DZ	History of Railway	KZ	4	8	L	PV
17W1EV	Public Sector Economy	KZ	4	8	Z	PV
15W1EH	European Integration within Historical Context	KZ	4	8	Z	PV
21W1FN	Factors Affecting the Rate of Accidents in Aviation	KZ	4	8	Z	PV
14W1HW	Computer Hardware	KZ	4	8	L	PV
15W1HD	History of City Public Transport	KZ	4	8	Z	PV
15W1HE	Work Hygiene and Ergonomics in Traffic	KZ	4	8	Z	PV
21W1LR	Radio Technology in Aviation	KZ	4	8	L	PV
17W1LL	Logistics of Passenger and Freight Air Transport	KZ	4	8	L	PV
21W1MZ	Managerial Ethics	KZ	4	8	Z	PV
11W1MM	Mathematical Models in Economy	KZ	4	8	Z	PV
17W1ND	Maritime Transportation	KZ	4	8	Z	PV
21W1OL	Security of Air Transport	KZ	4	8	L	PV
17W1OF	Personal Finance	KZ	4	8	Z	PV
17W1PM	Personal Management	KZ	4	8	L	PV
14W1PJ	C Programming Language	KZ	4	8	Z	PV

16W1PV	<b>Operation, Construction and Maintenance of Vehicles</b>	KZ	4	8	L	PV
17W1ST	<b>Titan Simulation</b>	KZ	4	8	L	PV
21W1TH	<b>Aircraft Technical Handling</b>	KZ	4	8	Z	PV
16W1TJ	<b>Technological Quality Aspects</b>	KZ	4	8	Z	PV
16W1TZ	<b>Transporting Devices</b>	KZ	4	8	L	PV
16W1ZL	<b>Vehicle Testing, Legislation and Construction</b>	KZ	4	8	Z	PV
21W1ZA	<b>Basics of Aerobatics</b>	KZ	4	8	L	PV
21W1UT	<b>Airports Maintenance</b>	KZ	4	8	L	PV
21W1RZ	<b>Human Resources Management</b>	KZ	4	8	L	PV

**Characteristics of the courses of this group of Study Plan: Code=W1-BKMED 14/15 Name=PVP bak.komb. MED 14/15**

17W1AF	<b>Alternative Forms of Transportation Project Financing</b>	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.						
15W1BO	<b>Work Safety and Health Protection</b>	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.						
17W1DZ	<b>Transported Commodities Cognization</b>	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.						
15W1DU	<b>Art History and Society</b>	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	<b>History of Railway</b>	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.						
17W1EV	<b>Public Sector Economy</b>	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	<b>European Integration within Historical Context</b>	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.						
21W1FN	<b>Factors Affecting the Rate of Accidents in Aviation</b>	KZ	4			
Introduction. The scope of international and national organizations in civil aviation. The scope of the investigation organisations within the state and international committees. Analysis and interpretation of ICAO Annexes 13 and 19. Analysis and interpretation of the Regulation (EC), Regulation (EU). Human factor. Utilization of information from the investigation reports.						
14W1HW	<b>Computer Hardware</b>	KZ	4			
Design combinational and sequential logical circuits and their implementation on FPGA, VHDL language. Computer architecture, structures of computer components - controller, ALU, memories, I/O subsystem, typical interfaces and buses (PCI Express, I2C, SPI, USB).						
15W1HD	<b>History of City Public Transport</b>	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	<b>Work Hygiene and Ergonomics in Traffic</b>	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.						
21W1LR	<b>Radio Technology in Aviation</b>	KZ	4			
Electric signals and the wave spectrum. Analog and digital modulations. Noises. Filters. Resonance circuits. Electromagnetic field. Electromagnetic wave propagation. Wave ranges in aviation, radiation and reception of electromagnetic field. Antennas in aviation, receivers and transmitters.						
17W1LL	<b>Logistics of Passenger and Freight Air Transport</b>	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.						
21W1MZ	<b>Managerial Ethics</b>	KZ	4			
The basic terminology of managerial ethics. Basics of etiquette and rules of social contact. Social events. Etiquette of working contacts. The art of presentation and negotiation. Personal image. Diplomatic protocol. Managerial ethics. Business ethics.						
11W1MM	<b>Mathematical Models in Economy</b>	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	<b>Maritime Transportation</b>	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.						
21W1OL	<b>Security of Air Transport</b>	KZ	4			
The development of civil aviation. Definitions and regulations. History of acts of unlawful interference. Terrorism in aviation. National security program. Crisis management. Protection at airports - operational procedures. Modern means of protection and control.						



17W1OF	Personal Finance	KZ	4
Personal finance (budget, financing of basic living needs), debt (loans and credits, payment instruments, interest and fees, debt trap), financing of housing (rent, mortgage, savings, consumer loans, refinancing), savings and investments (investment horizon, return, risk, investment strategy), insurance (insurance types, suitability and adequacy), securing the future (retirement savings and insurance).			
17W1PM	Personal Management	KZ	4
Human sources, work group, man as personality, planning, choice, evaluation and education of human sources, work adaptation, teamwork, intercultural communication.			
14W1PJ	C Programming Language	KZ	4
C programming language. Preprocessor, basics of the C language (data types, syntax, commands), functions, pointers, dynamical memory allocation, string, files, structures and unions. Implementations of abstract data types (FIFO, LIFO, list), programming techniques (sorting, searching, recursion), using bitwise operators.			
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.			
17W1ST	Titan Simulation	KZ	4
Titan is a management game simulating the business decisions. Lets 2-8 student groups to produce and compete in the market with the same product. Students set a price and determine the quantity and capacity of production, plan budgets for marketing, research and development. They become familiar with the consequences of their decisions by the form of financial corporate reports and they use this information for other business decisions.			
21W1TH	Aircraft Technical Handling	KZ	4
Aircraft towing and pushing tractors. GPU. Air conditioning and heating units. Aircraft fuel equipment. De-icing and anti-icing units. Loading and unloading units. Equipment for passengers onboarding and offboarding. Operational processes of aircraft technical handling and regulations. Modernization and technical progress.			
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.			
16W1TZ	Transporting Devices	KZ	4
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.			
16W1ZL	Vehicle Testing, Legislation and Construction	KZ	4
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.			
21W1ZA	Basics of Aerobatics	KZ	4
The history, development and aerobatics in present, aerodynamics and mechanics of flight during marginal flight modes, piloting technique of individual elements, competition aerobatics, aerobatics programs, preparation for practicing aerobatics and safety training, competitive psychology and concentration on performance.			
21W1UT	Airports Maintenance	KZ	4
Summer airport maintenance. Summer maintenance equipment. Winter airport maintenance. Winter maintenance equipment. De-icing / anti-icing of aircraft. De-icing / anti-icing liquid. Operating procedures, limitations, practices.			
21W1RZ	Human Resources Management	KZ	4
The position of human resources in the organization and related disciplines file. Substance, importance and challenges of human resources management. Internal and external environment of human resource management. Human resource planning. Search, recruitment and selection of employees. Motivation, evaluation and remuneration of staff. Positioning, dismissal and redundancies of employees. Education of employees. Planning career management.			

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) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
15JZ3A	Foreign Language - English 3	Z	3	0+4	Z	J
15JZ4A	Foreign Language - English 4	Z,ZK	3	0+4	L	J
15JZ3F	Foreign Language - French 3 Eva Rezlerová, Irena Veselková, Jan Feit	Z	3	0P+4C	Z	J
15JZ4F	Foreign Language - French 4 Eva Rezlerová, Irena Veselková, Jan Feit	Z,ZK	3	0P+4C+10B	L	J
15JZ3N	Foreign Language - German 3 Eva Rezlerová, Jan Feit, Jana Štikarová, Alexej Kusák, Petra Mračková Vavroušová Eva Rezlerová (Gar.)	Z	3	0P+4C	Z	J
15JZ4N	Foreign Language - German 4 Eva Rezlerová, Jan Feit, Jana Štikarová	Z,ZK	3	0P+4C+10B	L	J
15JZ3R	Foreign Language - Russian 3 Eva Rezlerová, Jan Feit, Marie Michlová	Z	3	0P+4C	Z	J
15JZ4R	Foreign Language - Russian 4 Eva Rezlerová, Jan Feit, Marie Michlová	Z,ZK	3	0P+4C+10B	L	J

15JZ3S	<b>Foreign Language - Spanish 3</b> <i>Eva Rezlerová, Jan Feit, Petra Mračková Vavroušová, Nina Hricsina Puškinová Petra Mračková Vavroušová (Gar.)</i>	Z	3	0P+4C	Z	J
15JZ4S	<b>Foreign Language - Spanish 4</b> <i>Eva Rezlerová, Jan Feit, Nina Hricsina Puškinová (Gar.)</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	<b>Foreign Language - English 3</b> Grammar structure and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faculty's fields of study. Focus on improvement in perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral and written forms. Technical texts and their features; practice of oral and written presentation.	Z	3			
15JZ4A	<b>Foreign Language - English 4</b> Grammar structure and stylistics. Conversational and specialised topics selected according to the language group level and with regard to the Faculty's fields of study. Focus on improvement in perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral and written forms. Technical texts and their features; practice of oral and written presentation.	Z,ZK	3			
15JZ3F	<b>Foreign Language - French 3</b> 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	<b>Foreign Language - French 4</b> 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	<b>Foreign Language - German 3</b> 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	<b>Foreign Language - German 4</b> Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.	Z,ZK	3			
15JZ3R	<b>Foreign Language - Russian 3</b> Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.	Z	3			
15JZ4R	<b>Foreign Language - Russian 4</b> Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.	Z,ZK	3			
15JZ3S	<b>Foreign Language - Spanish 3</b> Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.	Z	3			
15JZ4S	<b>Foreign Language - Spanish 4</b> Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.	Z,ZK	3			

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

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

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

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

Credits in the group: 6

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
15JZ1A	<b>Foreign Language - English 1</b> <i>Eva Rezlerová, Jan Feit, Marie Michlová, Klára Lancová, Lenka Monková, Jitka Heřmanová, Dana Boušová, Barbora Horáčková, Marek Tomeček, ..... Jitka Heřmanová (Gar.)</i>	Z	3	0P+4C	Z	J
15JZ2A	<b>Foreign Language - English 2</b> <i>Eva Rezlerová, Jan Feit, Marie Michlová, Lenka Monková, Jitka Heřmanová, Dana Boušová, Barbora Horáčková, Marek Tomeček, Peter Morpuss, .....</i>	Z,ZK	3	0P+4C+10B	L	J
15JZ1F	<b>Foreign Language - French 1</b>	Z	3	0+4	Z	J
15JZ2F	<b>Foreign Language - French 2</b>	Z,ZK	3	0+4	L	J
15JZ1N	<b>Foreign Language - German 1</b>	Z	3	0+4	Z	J
15JZ2N	<b>Foreign Language - German 2</b>	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. Eigenvalues 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
Orthographic and oblique projections, linear perspective. Topographic surfaces and their orthogonal projection. Differential geometry of curves - parameterization, arc of the curve, torsion and curvature, Frenet's trihedron. Kinematics - a curve as a trajectory of the motion, the velocity and acceleration of a particle moving on a curved path.			
11LA	Linear Algebra	Z,ZK	3
Vector spaces (linear combinations, linear independence, dimension, basis, coordinates). Matrices and operations. Systems of linear equations and their solvability. Determinants and their applications. Scalar product. Similarity of matrices (eigenvalues and eigenvectors). Quadratic forms and their classification.			

11MSP	Modeling of Systems and Processes	Z,ZK	4
Mathematical methods and algorithms as a basis for system analysis. Methods for modelling and evaluating the systems in continuous and discrete time domain. Laplace transform, z-transform, and the recursive algorithms in solution of differential and difference equations, as an instrument for system description. Practical use of technical computing environment (MATLAB).			
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 <sup>3</sup> , 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.			
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.			
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 post, 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.			
14W1HW	Computer Hardware	KZ	4
Design combinational and sequential logical circuits and their implementation on FPGA, VHDL language. Computer architecture, structures of computer components - controller, ALU, memories, I/O subsystem, typical interfaces and buses (PCI Express, I2C, SPI, USB).			
14W1PJ	C Programming Language	KZ	4
C programming language. Preprocessor, basics of the C language (data types, syntax, commands), functions, pointers, dynamical memory allocation, string, files, structures and unions. Implementations of abstract data types (FIFO, LIFO, list), programming techniques (sorting, searching, recursion), using bitwise operators.			
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 elemental 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 proprieties. 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. 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.			
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. Focus on improvement in perceptive and communicative skills; widening the vocabulary. Basic kinds of compositions. Presentations of own findings in both oral and written forms. Technical texts and their features; practice of oral and written presentation.			
15JZ4F	Foreign Language - French 4	Z,ZK	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JZ4N	Foreign Language - German 4	Z,ZK	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JZ4R	Foreign Language - Russian 4	Z,ZK	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JZ4S	Foreign Language - Spanish 4	Z,ZK	3
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
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	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.			
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.			
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.			
16W1TZ	Transporting Devices	KZ	4
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.			
16W1ZL	Vehicle Testing, Legislation and Construction	KZ	4
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.			
17DAS	Transportation and Communication Law	Z	1
Transportation and communication law - railway, road transport, ropeway, water road, air transport, telecommunication, post, patent.			
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.			
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.			
17E	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.			
17EDOT	Economy, Transport, Telecommunications	KZ	2
Transport, telecommunications, demand, supply, indicators, economic development, legislation, European union, regulation, liberalisation, transport modes, ITS, sustainability.			

17EDTP	Economy and Management of Transport and Telecommunication Processes	Z,ZK	3
Transport and telecommunication system, financing of transport infrastructure, transport policy, transport service, energy sources, public goods, externalities in transport and their treatment, assessment of public projects, CBA method, transport company, costing in transportation, transport quality.			
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.			
17ERP	Company Economy and Management	Z,ZK	3
Company and its neighbourhood, structure of assets and liabilities, depreciation, costs, revenues and profit, break-even point, costing, inventory, financial management, investment appraisal, basics of management, organizational structures, human resources management, marketing, company strategy, business plan.			
17FIF	Finances and Financing	KZ	2
Cash flow, cost and revenue flow. Financial system functions. Financial assets. Types of financing. Company cash flow. Short-term financing instruments. Long-term financing instruments. Trading financial instruments. Banking financial instruments. Financial risk allocation instruments. Payment and hedging instruments. Loan capital. Risk capital.			
17GEDS	Geography of Transport Systems	KZ	2
Regional differentiation of the transport system. Sociogeographic regionalization and its relation to transport. Transport and local and regional development. Spatial interaction - theoretical and methodological framework. Mobility research - travel behavior, mode choice and the influence onto "modal-split." Modal competition. Practical use of transport-geographical analysis in transportation planning.			
17HG	Economic Geography	Z	2
Introduction of the issues, definitions and introductory concepts. World geography and its research subject. Economic geography - Europe, Asia, Africa, Australia, America, the Czech Republic. Transport geography and its research subject. Characteristics of transportation as one of the branches of the global economy. Transport systems and their location in the world. Particular transport modes as part of the economy and the world transport system.			
17KS	Quality of Transport and Telecommunication Systems	KZ	2
Quality, systems, company, customer, norms, assessment, methods, indicators, satisfaction, loyalty.			
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.			
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.			
17MPD	Management of Technonology 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.			
17MR	Managerial Decision Making	KZ	3
Decision making, rationality, process, state of the world, CPM, PERT, trees, group, certainty, risk, uncertainty, preference.			
17MSTP	Small and Medium Enterprise	KZ	2
SME, design, plan, market, analysis, finance, management, decision making, survival, growth.			
17MVD	Marketing in Transportation	Z,ZK	2
General principles of the marketing applied in transportation. Marketing, marketing research, macroworld, microworld, markets, market positioning, products, brands, package, service, pricing, distribution channels, physical distribution, retail, wholesale, promotion, advertising, segmentation, placement, action plan.			
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.			
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.			
17PZL	Carriage and Forwarding	Z,ZK	3
Carriage, forwarding, economy, transport, supply, storage, warehouses, goods, passengers, insurance, distribution, customs.			
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.			
17TAC	Tariffs and Prices in Transport	Z	1
Transport and division of labour. Costs in transport. External costs. Financing of traffic in transport. Prices and tariffs. Tariffs of railway transport. Tariffs of road transport. Tariffs of air and water contract. Transport market. Service arrangement in public interest. Pricing policy history. Pricing in the EU.			
17TCHR	Tourist Trade Techniques	Z	1
Development and importance of the tourist trade, summary of tourist trade services with more detailed analysis of transport services and means of transport in the air, water and land (rail and road) transport.			
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 pasanger 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.			
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.			
17W1AF	Alternative Forms of Transportation Project Financing	KZ	4
It will be specified such forms of financing in trasportation, 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.			

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 assessment of public projects (CBA, MCA, CEA), tax system of the CR, state budget, management of public projects a their economic efficiency assessment, way of elaboration of PPP projects, funding from EU funds, program HDM-4.			
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.			
17W1OF	Personal Finance	KZ	4
Personal finance (budget, financing of basic living needs), debt (loans and credits, payment instruments, interest and fees, debt trap), financing of housing (rent, mortgage, savings, consumer loans, refinancing), savings and investments (investment horizon, return, risk, investment strategy), insurance (insurance types, suitability and adequacy), securing the future (retirement savings and insurance).			
17W1PM	Personal Management	KZ	4
Human sources, work group, man as personality, planning, choice, evaluation and education of human sources, work adaptation, teamwork, intercultural communication.			
17W1ST	Titan Simulation	KZ	4
Titan is a management game simulating the business decisions. Lets 2-8 student groups to produce and compete in the market with the same product. Students set a price and determine the quantity and capacity of production, plan budgets for marketing, research and development. They become familiar with the consequences of their decisions by the form of financial corporate reports and they use this information for other business decisions.			
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.			
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.			
21W1FN	Factors Affecting the Rate of Accidents in Aviation	KZ	4
Introduction. The scope of international and national organizations in civil aviation. The scope of the investigation organisations within the state and international committees. Analysis and interpretation of ICAO Annexes 13 and 19. Analysis and interpretation of the Regulation (EC), Regulation (EU). Human factor. Utilization of information from the investigation reports.			
21W1LR	Radio Technology in Aviation	KZ	4
Electric signals and the wave spectrum. Analog and digital modulations. Noises. Filters. Resonance circuits. Electromagnetic field. Electromagnetic wave propagation. Wave ranges in aviation, radiation and reception of electromagnetic field. Antennas in aviation, receivers and transmitters.			
21W1MZ	Managerial Ethics	KZ	4
The basic terminology of managerial ethics. Basics of etiquette and rules of social contact. Social events. Etiquette of working contacts. The art of presentation and negotiation. Personal image. Diplomatic protocol. Managerial ethics. Business ethics.			
21W1OL	Security of Air Transport	KZ	4
The development of civil aviation. Definitions and regulations. History of acts of unlawful interference. Terrorism in aviation. National security program. Crisis management. Protection at airports - operational procedures. Modern means of protection and control.			
21W1RZ	Human Resources Management	KZ	4
The position of human resources in the organization and related disciplines file. Substance, importance and challenges of human resources management. Internal and external environment of human resource management. Human resource planning. Search, recruitment and selection of employees. Motivation, evaluation and remuneration of staff. Positioning, dismissal and redundancies of employees. Education of employees. Planning career management.			
21W1TH	Aircraft Technical Handling	KZ	4
Aircraft towing and pushing tractors. GPU. Air conditioning and heating units. Aircraft fuel equipment. De-icing and anti-icing units. Loading and unloading units. Equipment for passengers onboarding and offboarding. Operational processes of aircraft technical handling and regulations. Modernization and technical progress.			
21W1UT	Airports Maintenance	KZ	4
Summer airport maintenance. Summer maintenance equipment. Winter airport maintenance. Winter maintenance equipment. De-icing / anti-icing of aircraft. De-icing / anti-icing liquid. Operating procedures, limitations, practices.			



21W1ZA	Basics of Aerobatics	KZ	4
The history, development and aerobatics in present, aerodynamics and mechanics of flight during marginal flight modes, piloting technique of individual elements, competition aerobatics, aerobatics programs, preparation for practicing aerobatics and safety training, competitive psychology and concentration on performance.			
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.			
23KM	Crisis Management	KZ	2
Theory and legal frame of crisis management with direction to Rescue system (IZS). After introduction to safety domain, there are terms and knowledge on theory and position of crisis management and its targets, IZS-crisis management-crisis planning and basic legislation. Practical part is concentrated to responsibility matrix compilation.			

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

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