

## Study plan

**Name of study plan: PRE bak. studium oboru MED roz azení od 15-16, od 3.ro níku obor MED v KOMBI form**

Faculty/Institute/Others:

Department:

Branch of study guaranteed by the department: Welcome page

Garantor of the study branch:

Program of study: Technology in Transportation and Telecommunications

Type of study: Bachelor combined

Required credits: 169

Elective courses credits: 11

Sum of credits in the plan: 180

Note on the plan:

Name of the block: Compulsory courses

Minimal number of credits of the block: 133

The role of the block: Z

Code of the group: 1S PRE 14-15 P

Name of the group: 1. sem. PRE 14-15 povinné p edm ty (spol. ást studia)

Requirement credits in the group: In this group you have to gain 30 credits

Requirement courses in the group: In this group you have to complete 12 courses

Credits in the group: 30

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
611LA	<b>Linear Algebra</b> <i>Romana Zibnerová</i>	Z,ZK	3	2P+1C+10B	Z	z
611MTA	<b>Mathematical Analysis</b>	Z,ZK	4	2+2	Z	z
612ZADI	<b>Introduction to Transportation Engineering</b>	Z,ZK	3	2+1	Z	z
617E	<b>Economics</b>	Z,ZK	3	2+1	Z	z
618MRI1	<b>Materials 1</b>	Z,ZK	3	2+1	Z	z
611GIE	<b>Geometry</b> <i>Vít Malinovský</i>	KZ	3	2P+2C+12B	Z	z
614KSP	<b>Constructing with Computer Aid</b> <i>Libor Židek</i>	KZ	2	0P+2C+8B	Z	z
614ZINF	<b>Fundamentals of Informatics</b>	KZ	2	0+2	Z	z
618TTED	<b>Creation of Technical Documentation</b>	KZ	2	2+1	Z	z
621ZLD	<b>Introduction to Air Transport</b>	KZ	2	2+1	Z	z
622UN	<b>Traffic Accidents Introduction</b>	Z	2	2+0	Z	z
TV-1	<b>Physical Education</b>	Z	1		Z	z

**Characteristics of the courses of this group of Study Plan: Code=1S PRE 14-15 P Name=1. sem. PRE 14-15 povinné p edm ty (spol. ást studia)**

611LA	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.
611MTA	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.
612ZADI	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.
617E	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.

618MRI1	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.			
611GIE	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.			
614KSP	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).			
614ZINF	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.			
618TTED	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.			
621ZLD	Introduction to Air Transport	KZ	2
Air transport as a component of complex transport system. International status of civil aviation. International organizations in Europe and worldwide. Characteristics of air transport. Commercial air transport. Technical operations of aeroplanes.			
622UN	Traffic Accidents Introduction	Z	2
TV-1	Physical Education	Z	1

Code of the group: 2S PRE 14-15 P

Name of the group: 2. sem. PRE 14-15 povinné p edm ty (spol. ást studia)

Requirement credits in the group: In this group you have to gain 30 credits

Requirement courses in the group: In this group you have to complete 12 courses

Credits in the group: 30

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
611FY1	Physics 1	Z,ZK	4	2+2	L	Z
611MVP	Mathematical Analysis of Function of More Variables	Z,ZK	3	2+2	L	Z
612PKD	Rail Transport Designing	Z,ZK	3	2+2	L	Z
617TDL	Transport Technology and Logistics	Z,ZK	3	2+2	L	Z
618ST	Statics	Z,ZK	3	2+1	L	Z
620UIS	Introduction to ITS	Z,ZK	3	2+1	L	Z
614SIAP	Networks and Protocols	KZ	2	1+1	L	Z
614UPRO	Introduction to Programming	KZ	2	0+2	L	Z
617EDOT	Economy, Transport, Telecommunications	KZ	2	2+0	L	Z
618MRI2	Materials 2	KZ	2	2+0	L	Z
611PT	Probability	Z	2	1+1	L	Z
TV-2	Physical Education	Z	1		L	Z

Characteristics of the courses of this group of Study Plan: Code=2S PRE 14-15 P Name=2. sem. PRE 14-15 povinné p edm ty (spol. ást studia)

611FY1	Physics 1	Z,ZK	4
Kinematics, particle dynamics, dynamics of particle systems and rigid body. Continuum mechanics, thermodynamics, electric field, directed electric current.			
611MVP	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.			
612PKD	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.			
617TDL	Transport Technology and Logistics	Z,ZK	3
Basic terms in transport technology and logistics. Particular steps of transport planning. Quantification of carriage relations. Line planning. Timetabling. Planning in 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.			
618ST	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.			

620UIS	Introduction to ITS 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.	Z,ZK	3
614SIAP	Networks and Protocols 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.	KZ	2
614UPRO	Introduction to Programming Algorithm development, methods of structured programming, high-level programming languages, basics of C programming languages (types, variables, conditions, cycles, arrays, functions), programming techniques, complexity.	KZ	2
617EDOT	Economy, Transport, Telecommunications Transport, telecommunications, demand, supply, indicators, economic development, legislation, European union, regulation, liberalisation, transport modes, ITS, sustainability.	KZ	2
618MRI2	Materials 2 Fundamental concepts, notions. The main materials groups. Semiconductors. Polymers. Special types of steel. Properties and application of the composite materials.	KZ	2
611PT	Probability Descriptive statistics. Basic probability concepts: elementary events and events, definitions and interpretation of probability. Random variable, probability distribution, probability mass and density, moments, some discrete and continuous distributions. Random vectors: joint and marginal distributions, mean vector, covariance matrix. Mixed distributions, mixture of distributions. Law of large numbers, central limit theorem.	Z	2
TV-2	Physical Education	Z	1

Code of the group: 3S PRE 15-16 P

Name of the group: 3. sem. bak. PRE 15-16 povinné p edm ty (spol. ást studia)

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
611DAD	Differential and Difference Equations	Z,ZK	3	2+1	Z	z
611FY2	Physics 2	Z,ZK	4	2+2	Z	z
611SIS	Statistics	Z,ZK	2	1+1	Z	z
612MDE	Transport Models and Transport Excesses Aneta Matysková, Josef Kocourek, Tomáš Pad lek	Z,ZK	3	2P+1C+8B	Z	z
616UDDM	Introduction to Transportation and Manipulation Technics	ZK	2	2+0	Z	z
618PZP	Elasticity and Strength Petr Koudelka, Tomáš Doktor, Jan Šleicht	Z,ZK	3	2P+1C+10B	Z	z
620SSA	Systems Analysis	Z,ZK	3	2+1	Z	z
612PPOK	Designing Roads, Highways and Motorways Ji í arský, Petr Kumpošt, Vojt ch Niž anský	KZ	3	1P+2C+10B	Z	z
614UATT	Introduction to Automatization and Telecommunication Systems	KZ	2	3+0	Z	z
614ZAET	Fundamentals of Electrotechnics	KZ	2	2+1	Z	z

Characteristics of the courses of this group of Study Plan: Code=3S PRE 15-16 P Name=3. sem. bak. PRE 15-16 povinné p edm ty (spol. ást studia)

611DAD	Differential and Difference Equations Concept of a differential equation of the first order and some methods of its solution. Differential equations of the n-th order, linear differential equations. Initial and boundary conditions for ordinary linear differential equation of the second order. Systems of linear differential equations. Difference equations, linear difference equations and their systems.	Z,ZK	3
611FY2	Physics 2 Magnetic field, electromagnetic field. Optics, quantum character of electromagnetic radiation. Introduction into quantization, hydrogen atom. Multi-electron atoms, the nuclei. Basics of solid body physics.	Z,ZK	4
611SIS	Statistics Point estimation, properties of point estimators, methods of point estimation. Testing statistical hypothesis. Fit test, independence test. Regression and correlation, linear regression, correlation coefficient, coefficient of determination, general linear model, statistical inference in linear regression, analysis of variance, multiple regression, use of matrices in regression.	Z,ZK	2
612MDE	Transport Models and Transport Excesses Parameters of the traffic flow and methods for their measurement. Models of the traffic flow, communications load, line and urban systems. Theory of queues, shock waves. Quality of transport and its assessment. Statistical characteristics of transport. Transport excesses, their analysis, the causes, identify and minimize the consequences. Improving of transport safety and fluency.	Z,ZK	3
616UDDM	Introduction to Transportation and Manipulation Technics Means of transportation and transportation systems. Principles, functions and arrangement of means of transportation. Motors and their characteristics. Water transportation. Manipulating technics. Principles of lifting machines and conveyors. Legislation.	ZK	2
618PZP	Elasticity and Strength 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.	Z,ZK	3

620SSA	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.			
612PPOK	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.			
614UATT	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.			
614ZAET	Fundamentals of Electrotechnics	KZ	2
Basic electrotechnic terms, circuit quantities. Periodic courses characteristics. Electric circuits elements and basic circuit members. Assigning of bipoles and basic circuit elements. Solution to direct current circuits with a help of circuit analysis elementary methods: method of consecutive reduction, unloaded voltage divider, current divider. Transfiguration star-triangular and principle of superposition in direct current circuits.			

Code of the group: 4S P MED 15-16 P

Name of the group: 4. sem. bak. PRE MED 15-16 povinné p edm ty

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
611MSP	<b>Modeling of Systems and Processes</b> Marek Honc	Z,ZK	4	2P+2C+12B	L	Z
617EDTP	<b>Economy and Management of Transport and Telecommunication Processes</b>	Z,ZK	3	2+1	L	Z
617MVD	<b>Marketing in Transportation</b>	Z,ZK	2	2+1	L	Z
618KIAD	<b>Kinematics and Dynamics</b>	Z,ZK	2	2+1	L	Z
617EM	<b>Management Science</b>	KZ	2	2+0	L	Z
617GEDS	<b>Geography of Transport Systems</b> Milan Kříž	KZ	2	2P+0C+8B	L	Z
617MEKA	<b>Methods of Economics Analysis</b> Otto Pastor	KZ	2	2P+0C+8B	Z	Z
617RIP	<b>Project Management</b>	KZ	2	2+0	L	Z
617HG	<b>Economic Geography</b>	Z	2	2+0	L	Z

Characteristics of the courses of this group of Study Plan: Code=4S P MED 15-16 P Name=4. sem. bak. PRE MED 15-16 povinné p edm ty

611MSP	Modeling of Systems and Processes	Z,ZK	4
System and subsystem, external and internal system description, continuous and discrete system, mathematics as a tool, examples of formulation of differential and differential equations. Linear and nonlinear system, stationary and non-stationary system, causality. Convolutional integral. Laplace and Z transformations. Transfer function. Stability of LTI systems. Discretization of continuous systems. System interconnection.			
617EDTP	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.			
617MVD	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.			
618KIAD	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.			
617EM	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.			
617GEDS	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.			
617MEKA	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.			

617RIP	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.			
617HG	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.			

Code of the group: 4S P MED 15-16 PV

Name of the group: 4. sem. bak. PRE MED 15-16 povinné p edm ty-výb r

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
614EAT	Economic Analyses in Spreadsheets Programs Environment	KZ	2	0+2	L	z
614WS1	Webdesign With Web Standards 1	KZ	2	0+2	L	z

Characteristics of the courses of this group of Study Plan: Code=4S P MED 15-16 PV Name=4. sem. bak. PRE MED 15-16 povinné p edm ty-výb r

614EAT	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.			
614WS1	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: 5S K MED 16-17 PV

Name of the group: 5. sem. bak. KOMBI 16-17 povinné p edm ty - výb r (obor MED)

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
614TEU	Creation of Scripts and Macros for Economic Tasks	KZ	2	0+2	Z	z
614WS2	Webdesign With Web Standards 2	KZ	2	0+2	Z	z

Characteristics of the courses of this group of Study Plan: Code=5S K MED 16-17 PV Name=5. sem. bak. KOMBI 16-17 povinné p edm ty - výb r (obor MED)

614TEU	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.			
614WS2	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: 5S K MED 16-17 P

Name of the group: 5. sem. bak. KOMBI 16-17 povinné p edm ty (obor MED)

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
617LOS	<b>Logistic Systems</b>	Z,ZK	3	2+1	Z	Z
617TGA	<b>Graph Theory and its Applications in Transport</b> <i>Josef Volek</i>	Z,ZK	4	2P+2C+12B	Z	Z
614DB	<b>Database Systems</b>	KZ	2	0+2	Z	Z
617DNU	<b>Transportation of Dangerous Goods</b>	KZ	2	2+0	Z	Z
617FIF	<b>Finances and Financing</b>	KZ	2	2+0	Z	Z
617MSTP	<b>Small and Medium Enterprise</b>	KZ	2	2+0	Z	Z
617PDO	<b>Designing of Public Transport Services</b>	KZ	3	2+1	Z	Z
623KM	<b>Crisis Management</b>	KZ	2	2+0	Z	Z
617TCHR	<b>Tourist Trade Techniques</b>	Z	1	2+0	Z	Z

**Characteristics of the courses of this group of Study Plan: Code=5S K MED 16-17 P Name=5. sem. bak. KOMBI 16-17 povinné p edm ty (obor MED)**

617LOS	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.		
617TGA	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.		
614DB	Database Systems	KZ	2	Dbf. terminology, fundamentals of relational and object database systems, database structure, relations modelling, relation algebra, dbf. tools, database design process, user interface, remote data access. Basic statement of SQL language. Expert systems and knowledge based applications, knowledge representation, methods of derivating and implementating, interface for knowledge systems design, certainty and uncertainty in knowledge systems.		
617DNU	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.		
617FIF	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.		
617MSTP	Small and Medium Enterprise	KZ	2	SME, design, plan, market, analysis, finance, management, decision making, survival, growth.		
617PDO	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.		
623KM	Crisis Management	KZ	2	Extraordinary events in transport. Crisis states. Authorities of crisis management of the state. Crisis and emergency planning. Precautions of economic mobilization of the state. Use of state material reserves. Organization conditions for crisis states treatment. Technical means for elimination of results of extraordinary events. Protection and renewal of transport infrastructure, ensuring of operation. Information systems of crisis management.		
617TCHR	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.		

Name of the block: Semestrální projekt

Minimal number of credits of the block: 6

The role of the block: ZP

Code of the group: PROJ 15-16

Name of the group: projekty 15-16 (4., 5., 6. sem.)

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

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

Credits in the group: 6

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
616X31	<b>Project 1</b>	Z	2	0P+1C	L	ZP
615X31	<b>Project 1</b>	Z	2	0P+1C	L	ZP

612X31	<b>Project 1</b> <i>Josef Kocourek, Jiří arský, Dagmar Koárková, Kristýna Neubergová, Tomáš Javoík</i>	Z	2	0P+1C	L	ZP
622X31	<b>Project 1</b>	Z	2	0P+1C	L	ZP
617X31	<b>Project 1</b>	Z	2	0P+1C	L	ZP
617X32	<b>Project 2</b>	Z	2	0P+2C	Z	ZP
612X32	<b>Project 2</b> <i>Josef Kocourek, Jiří arský, Petr Kumpošt, Dagmar Koárková, Tomáš Javoík, David Hudec, Roman Dostál, Andreas Papadopoulos, Zuzana arská, .....</i>	Z	2	0P+2C	Z	ZP
622X32	<b>Project 2</b>	Z	2	0P+2C	Z	ZP
615X32	<b>Project 2</b>	Z	2	0P+2C	Z	ZP
616X32	<b>Project 2</b>	Z	2	0P+2C	Z	ZP
615X33	<b>Project 3</b>	Z	2	0P+1C	L	ZP
616X33	<b>Project 3</b>	Z	2	0P+1C	L	ZP
612X33	<b>Project 3</b> <i>Josef Kocourek, Jiří arský, Dagmar Koárková, Kristýna Neubergová, Tomáš Javoík</i>	Z	2	0P+1C	L	ZP
617X33	<b>Project 3</b>	Z	2	0P+1C	L	ZP
622X33	<b>Project 3</b>	Z	2	0P+1C	L	ZP

**Characteristics of the courses of this group of Study Plan: Code=PROJ 15-16 Name=projekty 15-16 (4., 5., 6. sem.)**

616X31	Project 1	Z	2
615X31	Project 1	Z	2
612X31	Project 1	Z	2
622X31	Project 1	Z	2
617X31	Project 1	Z	2
617X32	Project 2	Z	2
612X32	Project 2	Z	2
622X32	Project 2	Z	2
615X32	Project 2	Z	2
616X32	Project 2	Z	2
615X33	Project 3	Z	2
616X33	Project 3	Z	2
612X33	Project 3	Z	2
617X33	Project 3	Z	2
622X33	Project 3	Z	2

Name of the block: Compulsory elective courses

Minimal number of credits of the block: 18

The role of the block: PV

Code of the group: PVP KOMBI 15-16

Name of the group: PVP pro KOMBI (MED) 15-16 (LS+ZS+LS)

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) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
617W1AF	<b>Alternative Forms of Transportation Project Financing</b>	KZ	4	8	Z	PV
615W1BO	<b>Work Safety and Health Protection in Transportation</b> <i>Petr Musil</i>	KZ	4	8B	L	PV
617W1EV	<b>Public Sector Economy</b>	KZ	4	8B	Z	PV
621W1FN	<b>Factors Affecting the Rate of Accidents in Aviation</b>	KZ	4	8	Z	PV
614W1HW	<b>Computer Hardware</b>	KZ	4	8B	L	PV
615W1HD	<b>History of City Mass Transport</b>	KZ	4	8	Z	PV
615W1HE	<b>Work Hygiene and Ergonomics in Traffic</b> <i>Petr Musil</i>	KZ	4	8B	Z	PV
621W1LR	<b>Radio Technology in Aviation</b>	KZ	4	8	L	PV

617W1LL	<b>Logistics of Passenger and Freight Air Transportation</b>	KZ	4	8B	L	PV
621W1MZ	<b>Managerial Ethics</b>	KZ	4	8	Z	PV
617W1ND	<b>Maritime Transportation</b>	KZ	4	8	Z	PV
621W1OL	<b>Security of Air Transport</b>	KZ	4	8	L	PV
617W1OF	<b>Personal Finance</b> <i>Alexandra Dvořáková</i>	KZ	4	8B	Z	PV
617W1PM	<b>Personnel Management</b> <i>Stanislava Holíčková</i>	KZ	4	8B	L	PV
614W1PJ	<b>C Programming Language</b>	KZ	4	8B	Z	PV
616W1PV	<b>Operation, Construction and Maintenance of Vehicles</b>	KZ	4	8B	L	PV
621W1RZ	<b>Human Resources Management</b>	KZ	4	8B	L	PV
617W1ST	<b>Titan Simulation</b> <i>Alexandra Dvořáková</i>	KZ	4	8B	L	PV
621W1TH	<b>Aircraft Technical Handling</b> <i>Slobodan Stoji</i>	KZ	4	8B	Z	PV
621W1UT	<b>Airports Maintenance</b>	KZ	4	8	L	PV
621W1ZA	<b>Basics of Aerobatics</b>	KZ	4	8	L	PV

**Characteristics of the courses of this group of Study Plan: Code=PVP KOMBI 15-16 Name=PVP pro KOMBI (MED) 15-16 (LS+ZS+LS)**

617W1AF	Alternative Forms of Transportation Project Financing	KZ	4			
There will be specified such forms of financing in transportation, where the public sector body perform the final debtor, i. e. debtor payments come from its budget, but the final debtor is not a direct participant of the transaction and it is not the counterparty of the financial institute which provides the funding. Issue of securities as an alternative source of transportation project.						
615W1BO	Work Safety and Health Protection in Transportation	KZ	4			
Fundamental legislative, definition of terms, risks and possible health damage, working conditions and health protection with focus on transportation. Health protection programmes, health insurance of home and foreign business trips, statistics, working practice.						
617W1EV	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.						
621W1FN	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.						
614W1HW	Computer Hardware	KZ	4			
Computer architecture, basics of logical circuits design and their realization using FPGA. In detail, description of computer architecture and separate parts designing - controllers, arithmetic and logical units, I/O subsystem.						
615W1HD	History of City Mass Transport	KZ	4			
History of city mass transport in the world, development of tram, bus and trolley-bus systems. History of transport networks in the world, current trends and developments of tariff and clearance systems. History of city transport in Prague and Brno. History of tram, bus and trolley-bus operation systems in the Czech Republic and Slovakia.						
615W1HE	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 man. Practical examples from the field of transportation; relevant legislative.						
621W1LR	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.						
617W1LL	Logistics of Passenger and Freight Air Transportation	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.						
621W1MZ	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.						
617W1ND	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.						
621W1OL	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.						
617W1OF	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).						
617W1PM	Personnel Management	KZ	4			
Human sources, work group, man as personality, planning, choice, evaluation and education of human sources, work adaptation, teamwork, intercultural communication.						
614W1PJ	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.						

616W1PV	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.			
621W1RZ	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.			
617W1ST	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.			
621W1TH	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.			
621W1UT	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.			
621W1ZA	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.			

Code of the group: PVP PRE 15-16

Name of the group: 3x PVP pro bak. PREZ od 15-16: DOS, MED (LS 15-16 +ZS+LS 16-17)

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

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

Credits in the group: 6

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
617Y1AF	Alternative Forms of Transportation Project Financing	KZ	2	2+0	Z	PV
618Y1AM	Anatomy, Mobility and Safety of Man	KZ	2	2P+0C	Z	PV
614Y1AV	Animation and Visualization	KZ	2	2P+0C	L	PV
620Y1AE	Applied Electronics	KZ	2	2P+0C	Z	PV
614Y1BE	Barrierless Transport	KZ	2	2P+0C	L	PV
615Y1BO	Work Safety and Health Protection in Transportation	KZ	2	2P+0C	L	PV
614Y1BM	Biometric Methods	KZ	2	2P+0C	Z	PV
623Y1DZ	Data and Their Processing for Engineering Fields Needs	KZ	2	2P+0C	Z	PV
615Y1DU	History of Art and Society	KZ	2	2+0	Z	PV
615Y1DZ	History of Railway	KZ	2	2P+0C	L	PV
612Y1DS	Project Documentation in Practice	KZ	2	2P+0C	Z	PV
618Y1D1	Dynamics of Routes and Vehicles 1	KZ	2	2+0	Z	PV
617Y1EV	Public Sector Economy	KZ	2	2P+0C	Z	PV
620Y1EK	Qualification in Electrical Engineering	KZ	2	2P+0C	L	PV
616Y1EN	Energy Requirements of Vehicles	KZ	2	2P+0C	L	PV
620Y1EA	Environmental Aspects of Transport	KZ	2	2P+0C	Z	PV
615Y1EH	European Integration within Historical Context	KZ	2	2P+0C	Z	PV
618Y1EM	Experimental Methods in Mechanics	KZ	2	2P+0C	Z	PV
621Y1FN	Factors Affecting the Rate of Accidents in Aviation	KZ	2	2+0	Z	PV
615Y1FD	French Area Studies and Transportation	KZ	2	2P+0C	L	PV
614Y1HW	Computer Hardware	KZ	2	2P+0C	L	PV
615Y1HL	(History of Civil Aviation)	KZ	2	2P+0C	L	PV
615Y1HD	History of City Mass Transport	KZ	2	2P+0C	Z	PV
612Y1HD	Traffic Noise	KZ	2	2P+0C	L	PV
615Y1HE	Work Hygiene and Ergonomics in Traffic	KZ	2	2P+0C	Z	PV
616Y1IS	Interactive simulators and simulations <i>Adam Orlický</i>	KZ	2	2P+0C	L	PV
612Y1KN	Combined Transportation	KZ	2	2P+0C	Z	PV

623Y1KO	<b>Quantum Physics and Optoelectronics</b>	KZ	2	2P+0C	L	PV
621Y1LR	<b>Radio Technology in Aviation</b>	KZ	2	2+0	L	PV
617Y1LL	<b>Logistics of Passenger and Freight Air Transport</b>	KZ	2	2P+0C	L	PV
620Y1LN	<b>Location and Navigation</b>	KZ	2	2P+0C	L	PV
621Y1MZ	<b>Managerial Ethics</b>	KZ	2	2+0	Z	PV
611Y1MM	<b>Mathematical Models in Economy</b>	KZ	2	2P+0C	Z	PV
618Y1MT	<b>Engineering Materials</b>	KZ	2	2P+0C	L	PV
614Y1MP	<b>Modeling Complex Assemblies and Models in Parametric Modeller</b>	KZ	2	2P+0C	Z	PV
617Y1ND	<b>Maritime Transportation</b>	KZ	2	2+0	Z	PV
615Y1NE	<b>German in the Economy and Society</b>	KZ	2	2P+0C	Z	PV
621Y1OL	<b>Security of Air Transport</b>	KZ	2	2+0	L	PV
623Y1OK	<b>Protection of Critical Objects and Infrastructures</b>	KZ	2	2P+0C	L	PV
620Y1OI	<b>Fare Collection and Information Systems</b>	KZ	2	2P+0C	L	PV
614Y1OP	<b>Operating System</b>	KZ	2	2P+0C	Z	PV
617Y1OF	<b>Personal Finance</b> <i>Alexandra Dvořáková</i>	KZ	2	2P+0C	Z	PV
611Y1PV	<b>Parametrical and Multicriterial Programming</b>	KZ	2	2P+0C	Z	PV
617Y1PM	<b>Personnel Management</b> <i>Stanislava Holíková</i>	KZ	2	2P+0C	L	PV
612Y1PC	<b>Pedestrian and Cycling Transport</b>	KZ	2	2P+0C	L	PV
614Y1PG	<b>Computer Graphics</b>	KZ	2	2P+0C	L	PV
614Y1P2	<b>Computer Aid of Transportation Projecting 2</b>	KZ	2	2P+0C	Z	PV
618Y1PS	<b>Computer Simulations in Mechanics</b>	KZ	2	2P+0C	L	PV
614Y1PI	<b>Corporate Information System</b>	KZ	2	2P+0C	Z	PV
612Y1PD	<b>Assessment of Transport</b> <i>Kristýna Neubergerová</i>	KZ	2	2P+0C	Z	PV
620Y1PK	<b>Product Quality Management Processes</b>	KZ	2	2P+0C	Z	PV
614Y1PJ	<b>C Programming Language</b>	KZ	2	2P+0C	Z	PV
612Y1C1	<b>Designing Roads in Civil 3D I</b>	KZ	2	2P+0C	L	PV
612Y1C2	<b>Designing Roads in Civil 3D II</b>	KZ	2	2P+0C	Z	PV
614Y1PA	<b>3D Modeling in AutoCAD</b>	KZ	2	2P+0C	Z	PV
616Y1PV	<b>Operation, Construction and Maintenance of Vehicles</b>	KZ	2	2P+0C	L	PV
612Y1PU	<b>Organization Disposition of Railway Stations</b>	KZ	2	2P+0C	L	PV
616Y1RE	<b>Control and Electronic Vehicle Systems</b>	KZ	2	2P+0C	Z	PV
621Y1RZ	<b>Human Resources Management</b>	KZ	2	2P+0C	L	PV
617Y1ST	<b>Titan Simulation</b> <i>Alexandra Dvořáková</i>	KZ	2	2P+0C	L	PV
620Y1SC	<b>Sensors and Actuators</b>	KZ	2	2P+0C	L	PV
611Y1SI	<b>Transportation Software Engineering</b>	KZ	2	2P+0C	Z	PV
622Y1SZ	<b>Forensic Expertise</b>	KZ	2	2+0	L	PV
616Y1KS	<b>Quality and Reliability of Vehicles</b>	KZ	2	2P+0C	Z	PV
612Y1SU	<b>Management and Maintenance of Roads</b>	KZ	2	2P+0C	L	PV
621Y1TH	<b>Aircraft Technical Handling</b>	KZ	2	2P+0C	Z	PV
611Y1TG	<b>Graph Theory</b>	KZ	2	2P+0C	L	PV
614Y1TI	<b>Creating Interactive Internet Applications</b>	KZ	2	2P+0C	L	PV
621Y1UT	<b>Airports Maintenance</b>	KZ	2	2+0	L	PV
618Y1UK	<b>Introduction of Rail Vehicles</b>	KZ	2	2P+0C	L	PV
612Y1VC	<b>Waterways and Shipping</b>	KZ	2	2P+0C	Z	PV
623Y1VS	<b>Negotiation and Cooperation</b>	KZ	2	2P+0C	Z	PV
614Y1VM	<b>Development of Applications for Mobile Devices</b>	KZ	2	2P+0C	Z	PV
616Y1VT	<b>Development in Railroad Vehicles</b>	KZ	2	2P+0C	L	PV
614Y1W1	<b>Webdesign 1</b>	KZ	2	2P+0C	Z	PV
614Y1W2	<b>Webdesign 2</b>	KZ	2	2P+0C	L	PV
616Y1ZG	<b>Introduction into Applied Computer Graphics</b>	KZ	2	2P+0C	L	PV

621Y1ZA	<b>Basics of Aerobatics</b>	KZ	2	2+0	L	PV
614Y1ZM	<b>Fundamentals of parametric and adaptive modeling</b>	KZ	2	2P+0C	L	PV
611Y1ZM	<b>Foundation of MATLAB Programming</b>	KZ	2	2P+0C	L	PV
612Y1ZU	<b>Principles of Urbanism</b>	KZ	2	2P+0C	Z	PV
616Y1ZL	<b>Vehicle Testing, Legislation and Construction</b>	KZ	2	2P+0C	Z	PV

**Characteristics of the courses of this group of Study Plan: Code=PVP PRE 15-16 Name=3x PVP pro bak. PREZ od 15-16: DOS, MED (LS 15-16 +ZS+LS 16-17)**

617Y1AF	Alternative Forms of Transportation Project Financing	KZ	2			
There will be specified such forms of financing in transportation, where the public sector body perform the final debtor, i. e. debtor payments come from its budget, but the final debtor is not a direct participant of the transaction and it is not the counterparty of the financial institute which provides the funding. Issue of securities as an alternative source of transportation project.						
618Y1AM	Anatomy, Mobility and Safety of Man	KZ	2			
Survey of tissues. Anatomical structure and growth of bones. Articular joint. Remodelling of bone tissue. Anatomical structure of muscles. Blood circulation and nervous system. Structure and biomechanics of muscular-skeletal system. Injury of human organs and musculo-skeletal system during traffic accidents. Mobility of ill and injured man and his treatment. Human joint prostheses. Protective means and traffic safety regulations.						
614Y1AV	Animation and Visualization	KZ	2			
Advanced modifications and modeling of NURBS, Patch objects, selection of objects (according to filter and properties). 3D Studio MAX systems and Space Warp objects. Atmospheric and other effects, rendering filters, Motion blur, advanced animations, Motion panel. Modeling for morphing and animation, bone formation, animation using Inverse Kinematics.						
620Y1AE	Applied Electronics	KZ	2			
Basic electronic semiconductor components, their principles, characteristics and typical connection diagrams. Semiconductor PN junction diodes, transistors, thyristor, operational amplifiers, basic logic gates. Functions of basic electronic circuits and methods for their designs (rectifiers, voltage regulator with Zener diode, transistor as an amplifier, operational amplifier as an inverting and noninverting amplifier).						
614Y1BE	Barrierless Transport	KZ	2			
The issue of barrierless accessible public transportation in terms of architectural barriers and also for transportation-technological point of view. Students will gain theoretical knowledge of barrierless environment roads, railway stations, public transport stops, terminal buildings, vehicles, public transport, information and orientation systems and transportation technology. Theoretical knowledge will be supplemented by practical examples.						
615Y1BO	Work Safety and Health Protection in Transportation	KZ	2			
Fundamental legislative, definition of terms, risks and possible health damage, working conditions and health protection with focus on transportation. Health protection programmes, health insurance of home and foreign business trips, statistics, working practice.						
614Y1BM	Biometric Methods	KZ	2			
Basic biometric terms, authentication methods, principles and performance measurement of biometric systems, overview of biometric technologies, hand geometry, iris recognition, retina recognition method, 2D and 3D face recognition, vein patterns on the wrist, ear biometrics, fingerprint recognition, skin spectroscopy, behavioral methods, the use of biometrics in transport applications, safety and risks of biometric technologies.						
623Y1DZ	Data and Their Processing for Engineering Fields Needs	KZ	2			
Courses of risk, basic terms, data collection, data sets, data random uncertainty and data epistemic uncertainty, data processing, hazard, risk, value scales, analytical, empirical and heuristic methods, hazard determination and risk determination, methods for variants' creation, decision support systems.						
615Y1DU	History of Art and Society	KZ	2			
History of art - definitions, terminology, division into periods. Architecture, fine arts, design. Situation in Central Europe, today in the Czech Republic. Stations, bridges, industrial buildings. Design of transport vehicles.						
615Y1DZ	History of Railway	KZ	2			
Horse-drawn railways, steam railways, railway network development in the 2nd half of 19th century, regional railways epoch, railways of the "First Republic", electric traction, World War II railways, railway development in the 2nd half of 20th century, high-speed railway origins, railway lines closing, important long-distance train connections, railway lines construction, railway accidents, railway junctions. Excursions and projections.						
612Y1DS	Project Documentation in Practice	KZ	2			
Project documentation creating. Project documentation types. Support materials for project documentation creating. Building permit obtaining process. Budget and pricing. Practical creation of some project documentation parts.						
618Y1D1	Dynamics of Routes and Vehicles 1	KZ	2			
Theory and analysis of vibration of multimass systems. Dynamical model of vehicle and interaction with transport structure. Assessment of structure vibration and allowable criteria. Vibroisolation and absorbers of dynamical effects. Methods of experimental dynamics. FEM in structure dynamics.						
617Y1EV	Public Sector Economy	KZ	2			
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.						
620Y1EK	Qualification in Electrical Engineering	KZ	2			
Practical experience with measurements in laboratories, electrical equipment, power supply, electrical installation of low voltage, electric shock hazard, symbols and labeling, nominal voltage, maximum allowed currents, electrical equipment protection against short circuit and overload protection, control and revision, first aid, legislation, standards and regulations in relation to health and safety and electrical engineering.						
616Y1EN	Energy Requirements of Vehicles	KZ	2			
Dynamics and the driving inertial of the vehicles. Types of energy - kinetic, static, heat, chemical and others. Ways of energy change into kinetic energy. Combustion engine, electric drive, steam engine, air engine. Energy accumulation means, accumulator, flywheel, fuel cell. Energy recuperation. WTW analysis.						
620Y1EA	Environmental Aspects of Transport	KZ	2			
State of the atmosphere, weather observation network, weather in transportation, road meteorology. Weather forecasting, data assimilation, probabilistic forecasts, forecast evaluation. Air quality, main pollutants and their effects, atmospheric chemistry, traffic emissions. Greenhouse gasses, carbon cycle, a role of energy and transportation in climate change.						
615Y1EH	European Integration within Historical Context	KZ	2			
Versailles system, formation of new states. Europe and the powers, League of Nations. European policy in the 1920s. Fascism, nacism, communism. Little Entente, its principles and goals. Europe after Hitler's getting to power, system of bilateral agreements. Decline of the LN. Rearrangement of powers during WWII. Cold war and its consequences for Europe. New quality of French-German relationship - a driving power of starting European integration.						
618Y1EM	Experimental Methods in Mechanics	KZ	2			
The purpose and role of experimental mechanics. Sensors for mechanical testing. Overview of experimental methods. Destructive and non-destructive testing of materials. Design of experimental procedures and sample preparation. Tensile and bending tests. Electrical resistance strain gages. Optical based strain measurement. Fatigue and lifetime prediction. Instrumented hardness testing. Introduction to electron microscopy. Errors in measurement.						

621Y1FN	Factors Affecting the Rate of Accidents in Aviation	KZ	2
Introduction. The scope of international and national organizations in civil aviation. The scope of the investigation organisations within the state and international committees. Analysis and interpretation of ICAO Annexes 13 and 19. Analysis and interpretation of the Regulation (EC), Regulation (EU). Human factor. Utilization of information from the investigation reports.			
615Y1FD	French Area Studies and Transportation	KZ	2
France - geography and regions, transport infrastructure. Paris and its sights, city public transport. Road traffic, motorways, railway traffic, TGV, air traffic, specialised terminology. French society and culture. Current political system. System of education, studying in France. Selected authors of French literature. French gastronomy.			
614Y1HW	Computer Hardware	KZ	2
Computer architecture, basics of logical circuits design and their realization using FPGA. In detail, description of computer architecture and separate parts designing - controllers, arithmetic and logical units, I/O subsystem.			
615Y1HL	(History of Civil Aviation)	KZ	2
Beginnings of flying, development of aircrafts lighter than air. Beginnings of aircrafts heavier than air. Czechoslovak aviation pioneers. Development of airports in the Czech Republic. World airports. Famous aviators. Helicopters. CSA airplanes. Development of aircrafts in Czechoslovakia between the years 1945-1989. Classic era of aviation. Golden era of civil aviation. Modern era of civil aviation. Airline companies. Supersonic flying.			
615Y1HD	History of City Mass Transport	KZ	2
History of city mass transport in the world, development of tram, bus and trolley-bus systems. History of transport networks in the world, current trends and developments of tariff and clearance systems. History of city transport in Prague and Brno. History of tram, bus and trolley-bus operation systems in the Czech Republic and Slovakia.			
612Y1HD	Traffic Noise	KZ	2
Acoustic introduction, basic terms, quantities. Basics of physiological acoustic, noise impacts on human body. Acoustic legislation, standards, regulations. Creation acoustic climate in area, principles of urban acoustic, noise transmission, soundproofing. Types of noise sources in area. Determination of acoustic situation in the area of interest. Methodology of computing and measurement of transport noise. Acoustic studies, measuring protocol.			
615Y1HE	Work Hygiene and Ergonomics in Traffic	KZ	2
Basic knowledge of occupational hygiene and ergonomics, and their application in transport. Working environment factors, and the influence of these factors on health of workers. Creation and protection of working conditions that do not damage public health. Mutual links man-machine-environment. Adaptation of technology to possibilities and skills of man. Practical examples from the field of transportation; relevant legislative.			
616Y1IS	Interactive simulators and simulations	KZ	2
Simulation theory and application of computing equipment. Creating computing models. Mechanical and dynamic systems and their mathematical models. Computing methods. Simulation of vehicle dynamics, on-land carriage in particular. Virtual reality systems. Practical exercise with simulation software and interactive simulators.			
612Y1KN	Combined Transportation	KZ	2
Combined transport strategy and legislation. Load units. Means of transport in combined transport. Combined transport systems. Transshipping areas. Multimodal logistic centres.			
623Y1KO	Quantum Physics and Optoelectronics	KZ	2
Ground of quantum physics. Application of quantum physics in practice. Optoelectronics. Production of optoelectronics components.			
621Y1LR	Radio Technology in Aviation	KZ	2
Electric signals and the wave spectrum. Analog and digital modulations. Noises. Filters. Resonance circuits. Electromagnetic field. Electromagnetic wave propagation. Wave ranges in aviation, radiation and reception of electromagnetic field. Antennas in aviation, receivers and transmitters.			
617Y1LL	Logistics of Passenger and Freight Air Transport	KZ	2
Logistics airline passenger and cargo. Aircraft and airport terminals for passenger and cargo transport. Airlines in terms of logistics systems. Aerial transport process passengers and air cargo. Information systems in air transport. Global distribution systems.			
620Y1LN	Location and Navigation	KZ	2
Description and examples of road networks, localization on the network. Routing algorithms, their properties and implementation. Description and examples of datasets for finding transport connections, routing algorithms, their properties and implementation.			
621Y1MZ	Managerial Ethics	KZ	2
The basic terminology of managerial ethics. Basics of etiquette and rules of social contact. Social events. Etiquette of working contacts. The art of presentation and negotiation. Personal image. Diplomatic protocol. Managerial ethics. Business ethics.			
611Y1MM	Mathematical Models in Economy	KZ	2
The goal of the course is to teach selected methods of linear programming, with theoretical procedures applicable for individual tasks and their program implementation. The outcome of the course is the ability to implement and solve basic tasks from the queue theory, graph theory and both free and constrained optimization.			
618Y1MT	Engineering Materials	KZ	2
Systematic overview of main classes of materials used in technical design. In addition to main classes of materials, i. e. metals, ceramics, polymers and composites, attention is paid to biological materials and to biomimetics. Integral approach to material selection process is also demonstrated based on so called Ashby's selection charts.			
614Y1MP	Modeling Complex Assemblies and Models in Parametric Modeller	KZ	2
Assemblies programming - tools and methodology of working subassemblies and assemblies, sheet metal parts modelling, welded assemblies, pipelines, and distribution lines. Photorealistic output rendering - physical and material properties, lighting sources. MKP - visual example.			
617Y1ND	Maritime Transportation	KZ	2
History and importance of the maritime transportation, theoretical discipline in maritime transportation, seafaring vessels, maritime ports and their utilization, inland logistic centre and maritime ports, transport corridors and link by maritime, river and rail transport I and II, global maritime corridors, logistics of maritime transportation, maritime transportation and smart containers, ITS in maritime transport.			
615Y1NE	German in the Economy and Society	KZ	2
Recent economic and social issues of German speaking countries and of the EU. Reading and listening of texts. Lexical, grammatical and semantic analysis of texts. Discussion on selected topics.			
621Y1OL	Security of Air Transport	KZ	2
The development of civil aviation. Definitions and regulations. History of acts of unlawful interference. Terrorism in aviation. National security program. Crisis management. Protection at airports - operational procedures. Modern means of protection and control.			
623Y1OK	Protection of Critical Objects and Infrastructures	KZ	2
Types of technological systems, critical item, risks and their courses, criticality, vulnerability, connectivity, dependability, resilience, failure, protection, safety of critical objects and critical infrastructures.			
620Y1OI	Fare Collection and Information Systems	KZ	2
Fare collection systems in public transport and their components (on-board units, validators, turnstiles, ...). Information systems and their components for users (timetables, maps, panels ...) and operators (cycles, location or current delay of vehicles, ...). The issue of tariff systems. Other examples of clearance systems (parking).			

614Y1OP	Operating System	KZ	2
Distributions. Installation GNU/Linux OS. X-window system. Rights management - users and groups, ACL rights. Filesystems and attributes. Programs and processes. OS boot, runlevels. Basic console programs / commands. Config files. SW management, package systems. Programs in graphic shell - text, spreadsheet, graphic editors, sound, video and communication. Services management. Safe and secure configuration of OS. Remote administration.			
617Y1OF	Personal Finance	KZ	2
Personal finance (budget, financing of basic living needs), debt (loans and credits, payment instruments, interest and fees, debt trap), financing of housing (rent, mortgage, savings, consumer loans, refinancing), savings and investments (investment horizon, return, risk, investment strategy), insurance (insurance types, suitability and adequacy), securing the future (retirement savings and insurance).			
611Y1PV	Parametrical and Multicriterial Programming	KZ	2
Solution to the problem of linear programming with a parameter in objective function, on right sides and in the matrix of coefficients of linear constraints. Computation of efficient solution.			
617Y1PM	Personnel Management	KZ	2
Human sources, work group, man as personality, planning, choice, evaluation and education of human sources, work adaptation, teamwork, intercultural communication.			
612Y1PC	Pedestrian and Cycling Transport	KZ	2
Routes for pedestrians. Pedestrian crossings. Modifications for blind, dim-sighted and disabled people. Design of cycle routes network. Ways of cycle route layout and design parameters for cyclists. Separation of cyclists from other transport modes. Cycle tracks and its design - one way streets, reserved traffic lanes, bus stops, crossings with other transport modes, crossroads. Traffic signs and road marking for cyclists.			
614Y1PG	Computer Graphics	KZ	2
Basic formats of graphic and possibilities of their editing and mutual conversion. Use of individual types according to character of work. Work with editing programs (within the user level scope) using layers, DPI, colors. Basics of digital photography, scanning and computer technology like monitors and graphics cards.			
614Y1P2	Computer Aid of Transportation Projecting 2	KZ	2
Overview of CAx application for transportation projecting aid. AutoCAD environment possibilities of basic tasks automatizing (programming, scripting, data exchange). Advanced blocks modification (attributes, relation to databases). Work in projecting group, external references. Basic tasks for cummunication projecting (clothoidic transition curve, cross-and longitudinal section). Basics of 3D modelling.			
618Y1PS	Computer Simulations in Mechanics	KZ	2
Principles and overview of programs for stress analysis of structures. Numerical methods in mechanics, finite element method. Geometric model development and adaptation of geometry from other CAE systems. Assignment of material properties. The types of elements and their use. Discretization of solid model. Boundary conditions and application of the load. Basic tasks of structural and modal analysis. Introduction to complex nonlinear problems.			
614Y1PI	Corporate Information System	KZ	2
Data-information-knowledge, components of information system, syntatic and semantic sense of data, structure of corporate information system, particular information system (personalistic, production, storage, etc.), corporate information politic and information control, risks of information system operation, legal environment of information system operation, state information system, information system security, data protection, safety politics.			
612Y1PD	Assessment of Transport	KZ	2
Assessment of transport structures, the EIA process. Multicriteria assessment methods, risk analysis, SWOT analysis. Landscape character, possibilities of its protection and assessment transport structures on the landscape. Rating fragmentation and landscape connectivity in the preparation of linear structures. Practical examples of assessment of traffic buildings on the environment.			
620Y1PK	Product Quality Management Processes	KZ	2
General principles of organization management. Management systems and international standards; quality management systems. Quality products, processes, systems. A framework of standards for systems management, management principles. Principles of process management, monitoring and measurement systems management. Uniform framework of standards for systems management. Process management principles. Metrology and testing. Product certification.			
614Y1PJ	C Programming Language	KZ	2
C programming language. Preprocessor, basics of the C language (data types, syntax, commands), functions, pointers, dynamical memory allocation, string, files, structures and unions. Implementations of abstract data types (FIFO, LIFO, list), programming techniques (sorting, searching, recursion), using bitwise operators.			
612Y1C1	Designing Roads in Civil 3D I	KZ	2
The course is devoted to the traffic buildings design field, specifically the design of roads as such, by the means of a 3D software. Students go through the complete design of this particular linear building, from the initial situation, over the longitudinal section, to the model and work sections and the cubic capacity calculation. The course also includes a basic explanation of the traffic building design in the real-life profession.			
612Y1C2	Designing Roads in Civil 3D II	KZ	2
The course is devoted to the traffic buildings design field, specifically the design of roads as such, by the means of a 3D software. Students go through the complete design of this particular linear building, from the initial situation, over the longitudinal section, to the model and work sections and the cubic capacity calculation. The previously acquired skills are improved and developed. Students learn to design intersections.			
614Y1PA	3D Modeling in AutoCAD	KZ	2
Work in 3D non-parametric modeller (AutoCAD) environment, scenes rendering, creation of planar and volumetric objects, user setup creation, object data creation, work with data connected with external database. Basic definition of work with lights, materials and reflexes. Models presentation.			
616Y1PV	Operation, Construction and Maintenance of Vehicles	KZ	2
Methods of vehicle production. Vehicle maintenance. Vehicle diagnostics. Maintenance and repair plans. Engine maintenance and emission measurement. Transmission mechanism. General principles of engine diagnostics.			
612Y1PU	Organization Disposition of Railway Stations	KZ	2
Connecting station. Passenger transport equipment. Freight transport equipment. Branch lines and railway traffic inside industrial company areas. Zone stations. Formation yards. Reserve stations. Technology of work in railway station with regard to its disposition. Railway station documentations in the Czech Republic railway network.			
616Y1RE	Control and Electronic Vehicle Systems	KZ	2
Elementary concepts of regulation. Tools for analytical solution, linear system description. Basic types of a regulator (PID), properties, advantages, disadvantages, function. Conventional and hybrid drive control. Electric drive. Vehicle communication bus (CAN, LIN, FlexRay, ISObus, KWP2000 protocole etc.). Vehicle electronic control, safety, communication and comfort systems.			
621Y1RZ	Human Resources Management	KZ	2
The position of human resources in the organization and related disciplines file. Substance, importance and challenges of human resources management. Internal and external environment of human resource management. Human resource planning. Search, recruitment and selection of employees. Motivation, evaluation and remuneration of staff. Positioning, dismissal and redundancies of employees. Education of employees. Planning career management.			
617Y1ST	Titan Simulation	KZ	2
Titan is a management game simulating the business decisions. Lets 2-8 student groups to produce and compete in the market with the same product. Students set a price and determine the quantity and capacity of production, plan budgets for marketing, research and development. They become familiar with the consequences of their decisions by the form of financial corporate reports and they use this information for other business decisions.			

620Y1SC	Sensors and Actuators	KZ	2
Principles of sensors and actuators. Basics of measuring theory and actuating influence. The respective technologies and construction principles. Sensors of mechanical, electro-magnetic, state (temperature, humidity), chemical and particle flow values. Electrical, pneumatic and hydraulic actuators and solid phase elements.			
611Y1SI	Transportation Software Engineering	KZ	2
Basic concepts of software engineering, ranging from domain analysis, requirement analysis and software architectures to analyses, design and implementation using formal techniques and practical usage.			
622Y1SZ	Forensic Expertise	KZ	2
Historical evolution of forensic engineering, forensic activity, current legislature in the Czech Republic, different disciplines, notion of forensic, forensic legislation, basic forensic acts, expert role in the obtaining proofs, forensic methodology. Notion of the evidence, general principles of evidence obtaining, metrology, protocol, evidences collection, site inspection, forensic report, elements. Finding, expert testimony / report.			
616Y1KS	Quality and Reliability of Vehicles	KZ	2
Quality and reliability theory in design, development, production and operation of vehicles. Definition and possible approach to quality and reliability. Key legislation. FMEA (Failure Mode and Effects Analysis), QFD (Quality Function Deployment), DFx (Design for Assamly, Manufacturing, Quality, Services ...) and other methods used in industrial applications. Knowledge-based systems of quality and reliability, data collection.			
612Y1SU	Management and Maintenance of Roads	KZ	2
Getting familiar with ownership of roads in the Czech Republic and the administration of the road at the state and county level. It is presented development of road network, short, medium and long-term strategy of the Ministry of Transport. Maintenance of roads winter and summer, its requirements, specifics, possibilities and repair methods are discussed in the classroom as well as investment activity in highway engineering.			
621Y1TH	Aircraft Technical Handling	KZ	2
Aircraft towing and pushing tractors. GPU. Air conditioning and heating units. Aircraft fuel equipment. De-icing and anti-icing units. Loading and unloading units. Equipment for passengers onboarding and offboarding. Operational processes of aircraft technical handling and regulations. Modernization and technical progress.			
611Y1TG	Graph Theory	KZ	2
Basic concepts and terminology of graph theory, graph representation. Problems of graph theory, problem instance. Graph search algorithms, trees, minimum spanning tree, shortest path problem, Eulerian path, bipartite graph matching, flow networks, circulations, critical path method, traveling salesman problem. Problem of existence and optimization and algorithms for their solving. Computational complexity, dealing with NP-complete problems, heuristics			
614Y1TI	Creating Interactive Internet Applications	KZ	2
Possibilities of scripting language PHP. Overview of PHP language syntax, and functions. Analysis of finished scripts and demonstration of solutions. Your own application programmed in PHP language.			
621Y1UT	Airports Maintenance	KZ	2
Summer airport maintenance. Summer maintenance equipment. Winter airport maintenance. Winter maintenance equipment. De-icing / anti-icing of aircraft. De-icing / anti-icing liquid. Operating procedures, limitations, practices.			
618Y1UK	Introduction of Rail Vehicles	KZ	2
Basic characteristics and parameters rail transport systems - railway and urban transport. Basis driving mechanics rail vehicles - equation of motion train and unit trains. Rolling and track resistance. Total running resistance. Acceleration force. Analyzing driving cycle rail vehicle. Speed-power diagrams and characteristics rail vehicle - hydromechanic, hydrodynamic and electric drive. Design concept rail vehicles and drive of wheel set.			
612Y1VC	Waterways and Shipping	KZ	2
Basic modes of transport. The position of water transport in the transport system of the Czech Republic and the EU. Advantages and disadvantages of water transport. Basic systems of waterways in Europe, a network of waterways in the Czech Republic. Construction of the waterway and its equipment. Management of waterways and its operation. The legal regime in inland navigation, navigation rules of operation, navigation maps.			
623Y1VS	Negotiation and Cooperation	KZ	2
Code of conduct for negotiation. The influence of personality traits on the negotiations. Negotiation and commanding. Teamwork. Variants teams. Informal and formal role in the team. Principles of negotiation, the essence of negotiation, the differences in negotiation in business and in crisis situations, the principle of "win both", specifications and bidding, the role of trust.			
614Y1VM	Development of Applications for Mobile Devices	KZ	2
Object oriented programming, Java programming language, development environment, operating system Android, development application - widgets, containers, threads, menu, permissions, services, GUI.			
616Y1VT	Development in Railroad Vehicles	KZ	2
Railroad vehicles traction. Railroad vehicle parameters regulation. Control and driving of railroad vehicles. Importance in heavy duty and personal transportation. Critical situation assesment. New materials in design. International standardization.			
614Y1W1	Webdesign 1	KZ	2
Students will learn the basics of communication HTTP, URL and addressing, markup languages HTML and XHTML, HTML tags, rules of web accessibility and usability, CSS properties and selectors, the issue of web browsers, creating one to three column layout pages, sites validation, conditional comments. Topics will be practiced on practical examples.			
614Y1W2	Webdesign 2	KZ	2
Students will learn advanced techniques CSS, responsive webdesign, CSS frontends, content management systems, JavaScript, jQuery, SEO, web server installation + configuration directives. Topics will be practiced on practical examples.			
616Y1ZG	Introduction into Applied Computer Graphics	KZ	2
Computer graphics, division and applications with emphasis on transport, including development and research. Colours, colour perception, colour schemes, models, principles of 2D and 3D generation, elementary algorithms for graphic data workout. Visualisation principles and tasks, technics, graphics and visualisation HW basics. Introduction to 2D and 3D graphics software.			
621Y1ZA	Basics of Aerobatics	KZ	2
The history, development and aerobatics in present, aerodynamics and mechanics of flight during marginal flight modes, piloting technique of individual elements, competition aerobatics, aerobatics programs, preparation for practicing aerobatics and safety training, competitive psychology and concentration on performance.			
614Y1ZM	Fundamentals of parametric and adaptive modeling	KZ	2
Basics of work at products and parts creation. Sketch drawing by help of geometric relations, parametric dimensions, creation of adaptive models from 2D sketches. Import and export from and to another systems. Fundamentals of assemblies creation.			
611Y1ZM	Foundation of MATLAB Programming	KZ	2
To explain the principle of algorithmization, flow charts, description of MATLAB environment and its settings, MATLAB help, mathematical operators, matrices and elements operations, control flow, inputs and outputs, graphics, optimization and program code debugging.			
612Y1ZU	Principles of Urbanism	KZ	2
Survey on history of city and settlement building. Functional components and their mutual relations (working, living, recreation, transportation). Spatial arrangement of settlements. Types of towns or cities with a certain prevailing function, forms of their development. Brief overview of land-use planning.			

616Y1ZL	Vehicle Testing, Legislation and Construction	KZ	2
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.			

Name of the block: Jazyky

Minimal number of credits of the block: 12

The role of the block: J

Code of the group: JAZ 1 PRE (3.-4.SEM)

Name of the group: Jazyky bak. PRE pro 3. a 4. sem. (1.cizí jazyk)

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
615JZ1A	Foreign Language - English 1 <i>V ra Pastorková</i>	Z	3	0P+4C+10B	Z	J
615JZ2A	Foreign Language - English 2 <i>V ra Pastorková</i>	Z,ZK	3	0P+4C+10B	L	J
615JZ1N	Foreign Language - German 1	Z	3	0+4	Z	J
615JZ2N	Foreign Language - German 2	Z,ZK	3	0+4	L	J
615JZ1R	Foreign Language - Russian 1	Z	3	10	Z	J
615JZ2R	Foreign Language - Russian 2	Z,ZK	3	0+4	L	J

Characteristics of the courses of this group of Study Plan: Code=JAZ 1 PRE (3.-4.SEM) Name=Jazyky bak. PRE pro 3. a 4. sem. (1.cizí jazyk)

615JZ1A	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.		
615JZ2A	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.		
615JZ1N	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.		
615JZ2N	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.		
615JZ1R	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.		
615JZ2R	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.		

Code of the group: JAZ 2 K (5.-6.SEM)

Name of the group: Jazyky KOMBI pro 5. a 6. sem. (2.cizí jazyk)

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
615JZ3A	Foreign Language - English 3	Z	3	0P+4C	Z	J
615JZ4A	Foreign Language - English 4	Z,ZK	3	0+4	L	J

615JZ3N	<b>Foreign Language - German 3</b> <i>René Skalický</i>	Z	3	OP4C+10B	Z	J
615JZ4N	<b>Foreign Language - German 4</b> <i>René Skalický</i>	Z,ZK	3	OP4C+10B	L	J
615JZ3R	<b>Foreign Language - Russian 3</b> <i>Vilma Gottwaldová</i>	Z	3	OP4C+10B	Z	J
615JZ4R	<b>Foreign Language - Russian 4</b> <i>Vilma Gottwaldová</i>	Z,ZK	3	OP4C+10B	L	J

**Characteristics of the courses of this group of Study Plan: Code=JAZ 2 K (5.-6.SEM) Name=Jazyky KOMBI pro 5. a 6. sem. (2.cizí jazyk)**

615JZ3A	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.						
615JZ4A	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.						
615JZ3N	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.						
615JZ4N	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.						
615JZ3R	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.						
615JZ4R	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.						

**List of courses of this pass:**

Code	Name of the course	Completion	Credits
611DAD	Differential and Difference Equations	Z,ZK	3
Concept of a differential equation of the first order and some methods of its solution. Differential equations of the n-th order, linear differential equations. Initial and boundary conditions for ordinary linear differential equation of the second order. Systems of linear differential equations. Difference equations, linear difference equations and their systems.			
611FY1	Physics 1	Z,ZK	4
Kinematics, particle dynamics, dynamics of particle systems and rigid body. Continuum mechanics, thermodynamics, electric field, directed electric current.			
611FY2	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.			
611GIE	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.			
611LA	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.			
611MSP	Modeling of Systems and Processes	Z,ZK	4
System and subsystem, external and internal system description, continuous and discrete system, mathematics as a tool, examples of formulation of differential and differential equations. Linear and nonlinear system, stationary and non-stationary system, causality. Convolutional integral. Laplace and Z transformations. Transfer function. Stability of LTI systems. Discretization of continuous systems. System interconnection.			
611MTA	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.			
611MVP	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.			
611PT	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.			

611SIS	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.			
611Y1MM	Mathematical Models in Economy	KZ	2
The goal of the course is to teach selected methods of linear programming, with theoretical procedures applicable for individual tasks and their program implementation. The outcome of the course is the ability to implement and solve basic tasks from the queue theory, graph theory and both free and constrained optimization.			
611Y1PV	Parametrical and Multicriterial Programming	KZ	2
Solution to the problem of linear programming with a parameter in objective function, on right sides and in the matrix of coefficients of linear constraints. Computation of efficient solution.			
611Y1SI	Transportation Software Engineering	KZ	2
Basic concepts of software engineering, ranging from domain analysis, requirement analysis and software architectures to analyses, design and implementation using formal techniques and practical usage.			
611Y1TG	Graph Theory	KZ	2
Basic concepts and terminology of graph theory, graph representation. Problems of graph theory, problem instance. Graph search algorithms, trees, minimum spanning tree, shortest path problem, Eulerian path, bipartite graph matching, flow networks, circulations, critical path method, traveling salesman problem. Problem of existence and optimization and algorithms for their solving. Computational complexity, dealing with NP-complete problems, heuristics			
611Y1ZM	Foundation of MATLAB Programming	KZ	2
To explain the principle of algorithmization, flow charts, description of MATLAB environment and its settings, MATLAB help, mathematical operators, matrices and elements operations, control flow, inputs and outputs, graphics, optimization and program code debugging.			
612MDE	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.			
612PKD	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.			
612PPOK	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.			
612X31	Project 1	Z	2
612X32	Project 2	Z	2
612X33	Project 3	Z	2
612Y1C1	Designing Roads in Civil 3D I	KZ	2
The course is devoted to the traffic buildings design field, specifically the design of roads as such, by the means of a 3D software. Students go through the complete design of this particular linear building, from the initial situation, over the longitudinal section, to the model and work sections and the cubic capacity calculation. The course also includes a basic explanation of the traffic building design in the real-life profession.			
612Y1C2	Designing Roads in Civil 3D II	KZ	2
The course is devoted to the traffic buildings design field, specifically the design of roads as such, by the means of a 3D software. Students go through the complete design of this particular linear building, from the initial situation, over the longitudinal section, to the model and work sections and the cubic capacity calculation. The previously acquired skills are improved and developed. Students learn to design intersections.			
612Y1DS	Project Documentation in Practice	KZ	2
Project documentation creating. Project documentation types. Support materials for project documentation creating. Building permit obtaining process. Budget and pricing. Practical creation of some project documentation parts.			
612Y1HD	Traffic Noise	KZ	2
Acoustic introduction, basic terms, quantities. Basics of physiological acoustic, noise impacts on human body. Acoustic legislation, standards, regulations. Creation acoustic climate in area, principles of urban acoustic, noise transmission, soundproofing. Types of noise sources in area. Determination of acoustic situation in the area of interest. Methodology of computing and measurement of transport noise. Acoustic studies, measuring protocol.			
612Y1KN	Combined Transportation	KZ	2
Combined transport strategy and legislation. Load units. Means of transport in combined transport. Combined transport systems. Transshipping areas. Multimodal logistic centres.			
612Y1PC	Pedestrian and Cycling Transport	KZ	2
Routes for pedestrians. Pedestrian crossings. Modifications for blind, dim-sighted and disabled people. Design of cycle routes network. Ways of cycle route layout and design parameters for cyclists. Separation of cyclists from other transport modes. Cycle tracks and its design - one way streets, reserved traffic lanes, bus stops, crossings with other transport modes, crossroads. Traffic signs and road marking for cyclists.			
612Y1PD	Assessment of Transport	KZ	2
Assessment of transport structures, the EIA process. Multicriteria assessment methods, risk analysis, SWOT analysis. Landscape character, possibilities of its protection and assessment transport structures on the landscape. Rating fragmentation and landscape connectivity in the preparation of linear structures. Practical examples of assessment of traffic buildings on the environment.			
612Y1PU	Organization Disposition of Railway Stations	KZ	2
Connecting station. Passenger transport equipment. Freight transport equipment. Branch lines and railway traffic inside industrial company areas. Zone stations. Formation yards. Reserve stations. Technology of work in railway station with regard to its disposition. Railway station documentations in the Czech Republic railway network.			
612Y1SU	Management and Maintenance of Roads	KZ	2
Getting familiar with ownership of roads in the Czech Republic and the administration of the road at the state and county level. It is presented development of road network, short, medium and long-term strategy of the Ministry of Transport. Maintenance of roads winter and summer, its requirements, specifics, possibilities and repair methods are discussed in the classroom as well as investment activity in highway engineering.			
612Y1VC	Waterways and Shipping	KZ	2
Basic modes of transport. The position of water transport in the transport system of the Czech Republic and the EU. Advantages and disadvantages of water transport. Basic systems of waterways in Europe, a network of waterways in the Czech Republic. Construction of the waterway and its equipment. Management of waterways and its operation. The legal regime in inland navigation, navigation rules of operation, navigation maps.			
612Y1ZU	Principles of Urbanism	KZ	2
Survey on history of city and settlement building. Functional components and their mutual relations (working, living, recreation, transportation). Spatial arrangement of settlements. Types of towns or cities with a certain prevailing function, forms of their development. Brief overview of land-use planning.			

612ZADI	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.			
614DB	Database Systems	KZ	2
Dbf. terminology, fundamentals of relational and object database systems, database structure, relations modelling, relation algebra, dbf. tools, database design process, user interface, remote data access. Basic statement of SQL language. Expert systems and knowledge based applications, knowledge representation, methods of derivating and implementing, interface for knowledge systems design, certainty and uncertainty in knowledge systems.			
614EAT	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.			
614KSP	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).			
614SIAP	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.			
614TEU	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.			
614UATT	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.			
614UPRO	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.			
614W1HW	Computer Hardware	KZ	4
Computer architecture, basics of logical circuits design and their realization using FPGA. In detail, description of computer architecture and separate parts designing - controllers, arithmetic and logical units, I/O subsystem.			
614W1PJ	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.			
614WS1	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.			
614WS2	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.			
614Y1AV	Animation and Visualization	KZ	2
Advanced modifications and modeling of NURBS, Patch objects, selection of objects (according to filter and properties). 3D Studio MAX systems and Space Warp objects. Atmospheric and other effects, rendering filters, Motion blur, advanced animations, Motion panel. Modeling for morphing and animation, bone formation, animation using Inverse Kinematics.			
614Y1BE	Barrierless Transport	KZ	2
The issue of barrierless accessible public transportation in terms of architectural barriers and also for transportation-technological point of view. Students will gain theoretical knowledge of barrierless environment roads, railway stations, public transport stops, terminal buildings, vehicles, public transport, information and orientation systems and transportation technology. Theoretical knowledge will be supplemented by practical examples.			
614Y1BM	Biometric Methods	KZ	2
Basic biometric terms, authentication methods, principles and performance measurement of biometric systems, overview of biometric technologies, hand geometry, iris recognition, retina recognition method, 2D and 3D face recognition, vein patterns on the wrist, ear biometrics, fingerprint recognition, skin spectroscopy, behavioral methods, the use of biometrics in transport applications, safety and risks of biometric technologies.			
614Y1HW	Computer Hardware	KZ	2
Computer architecture, basics of logical circuits design and their realization using FPGA. In detail, description of computer architecture and separate parts designing - controllers, arithmetic and logical units, I/O subsystem.			
614Y1MP	Modeling Complex Assemblies and Models in Parametric Modeller	KZ	2
Assemblies programming - tools and methodology of working subassemblies and assemblies, sheet metal parts modelling, welded assemblies, pipelines, and distribution lines. Photorealistic output rendering - physical and material properties, lighting sources. MKP - visual example.			
614Y1OP	Operating System	KZ	2
Distributions. Installation GNU/Linux OS. X-window system. Rights management - users and groups, ACL rights. Filesystems and attributes. Programs and processes. OS boot, runlevels. Basic console programs / commands. Config files. SW management, package systems. Programs in graphic shell - text, spreadsheet, graphic editors, sound, video and communication. Services management. Safe and secure configuration of OS. Remote administration.			
614Y1P2	Computer Aid of Transportation Projecting 2	KZ	2
Overview of CAx application for transportation projecting aid. AutoCAD environment possibilities of basic tasks automatizing (programming, scripting, data exchange). Advanced blocks modification (attributes, relation to databases). Work in projecting group, external references. Basic tasks for communication projecting (clothoid transition curve, cross-and longitudinal section). Basics of 3D modelling.			
614Y1PA	3D Modeling in AutoCAD	KZ	2
Work in 3D non-parametric modeller (AutoCAD) environment, scenes rendering, creation of planar and volumetric objects, user setup creation, object data creation, work with data connected with external database. Basic definition of work with lights, materials and reflexes. Models presentation.			
614Y1PG	Computer Graphics	KZ	2
Basic formats of graphic and possibilities of their editing and mutual conversion. Use of individual types according to character of work. Work with editing programs (within the user level scope) using layers, DPI, colors. Basics of digital photography, scanning and computer technology like monitors and graphics cards.			

614Y1PI	Corporate Information System	KZ	2
Data-information-knowledge, components of information system, syntactic and semantic sense of data, structure of corporate information system, particular information system (personalistic, production, storage, etc.), corporate information politic and information control, risks of information system operation, legal environment of information system operation, state information system, information system security, data protection, safety politics.			
614Y1PJ	C Programming Language	KZ	2
C programming language. Preprocessor, basics of the C language (data types, syntax, commands), functions, pointers, dynamical memory allocation, string, files, structures and unions. Implementations of abstract data types (FIFO, LIFO, list), programming techniques (sorting, searching, recursion), using bitwise operators.			
614Y1TI	Creating Interactive Internet Applications	KZ	2
Possibilities of scripting language PHP. Overview of PHP language syntax, and functions. Analysis of finished scripts and demonstration of solutions. Your own application programmed in PHP language.			
614Y1VM	Development of Applications for Mobile Devices	KZ	2
Object oriented programming, Java programming language, development environment, operating system Android, development application - widgets, containers, threads, menu, permissions, services, GUI.			
614Y1W1	Webdesign 1	KZ	2
Students will learn the basics of communication HTTP, URL and addressing, markup languages HTML and XHTML, HTML tags, rules of web accessibility and usability, CSS properties and selectors, the issue of web browsers, creating one to three column layout pages, sites validation, conditional comments. Topics will be practiced on practical examples.			
614Y1W2	Webdesign 2	KZ	2
Students will learn advanced techniques CSS, responsive webdesign, CSS frontends, content management systems, JavaScript, jQuery, SEO, web server installation + configuration directives. Topics will be practiced on practical examples.			
614Y1ZM	Fundamentals of parametric and adaptive modeling	KZ	2
Basics of work at products and parts creation. Sketch drawing by help of geometric relations, parametric dimensions, creation of adaptive models from 2D sketches. Import and export from and to another systems. Fundamentals of assemblies creation.			
614ZAET	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.			
614ZINF	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.			
615JZ1A	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.			
615JZ1N	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.			
615JZ1R	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.			
615JZ2A	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.			
615JZ2N	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.			
615JZ2R	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.			
615JZ3A	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.			
615JZ3N	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.			
615JZ3R	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.			
615JZ4A	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.			

615JZ4N	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.			
615JZ4R	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.			
615W1BO	Work Safety and Health Protection in Transportation	KZ	4
Fundamental legislative, definition of terms, risks and possible health damage, working conditions and health protection with focus on transportation. Health protection programmes, health insurance of home and foreign business trips, statistics, working practice.			
615W1HD	History of City Mass Transport	KZ	4
History of city mass transport in the world, development of tram, bus and trolley-bus systems. History of transport networks in the world, current trends and developments of tariff and clearance systems. History of city transport in Prague and Brno. History of tram, bus and trolley-bus operation systems in the Czech Republic and Slovakia.			
615W1HE	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 man. Practical examples from the field of transportation; relevant legislative.			
615X31	Project 1	Z	2
615X32	Project 2	Z	2
615X33	Project 3	Z	2
615Y1BO	Work Safety and Health Protection in Transportation	KZ	2
Fundamental legislative, definition of terms, risks and possible health damage, working conditions and health protection with focus on transportation. Health protection programmes, health insurance of home and foreign business trips, statistics, working practice.			
615Y1DU	History of Art and Society	KZ	2
History of art - definitions, terminology, division into periods. Architecture, fine arts, design. Situation in Central Europe, today in the Czech Republic. Stations, bridges, industrial buildings. Design of transport vehicles.			
615Y1DZ	History of Railway	KZ	2
Horse-drawn railways, steam railways, railway network development in the 2nd half of 19th century, regional railways epoch, railways of the "First Republic", electric traction, World War II railways, railway development in the 2nd half of 20th century, high-speed railway origins, railway lines closing, important long-distance train connections, railway lines construction, railway accidents, railway junctions. Excursions and projections.			
615Y1EH	European Integration within Historical Context	KZ	2
Versailles system, formation of new states. Europe and the powers, League of Nations. European policy in the 1920s. Fascism, nazism, communism. Little Entente, its principles and goals. Europe after Hitler's getting to power, system of bilateral agreements. Decline of the LN. Rearrangement of powers during WWII. Cold war and its consequences for Europe. New quality of French-German relationship - a driving power of starting European integration.			
615Y1FD	French Area Studies and Transportation	KZ	2
France - geography and regions, transport infrastructure. Paris and its sights, city public transport. Road traffic, motorways, railway traffic, TGV, air traffic, specialised terminology. French society and culture. Current political system. System of education, studying in France. Selected authors of French literature. French gastronomy.			
615Y1HD	History of City Mass Transport	KZ	2
History of city mass transport in the world, development of tram, bus and trolley-bus systems. History of transport networks in the world, current trends and developments of tariff and clearance systems. History of city transport in Prague and Brno. History of tram, bus and trolley-bus operation systems in the Czech Republic and Slovakia.			
615Y1HE	Work Hygiene and Ergonomics in Traffic	KZ	2
Basic knowledge of occupational hygiene and ergonomics, and their application in transport. Working environment factors, and the influence of these factors on health of workers. Creation and protection of working conditions that do not damage public health. Mutual links man-machine-environment. Adaptation of technology to possibilities and skills of man. Practical examples from the field of transportation; relevant legislative.			
615Y1HL	(History of Civil Aviation)	KZ	2
Beginnings of flying, development of aircrafts lighter than air. Beginnings of aircrafts heavier than air. Czechoslovak aviation pioneers. Development of airports in the Czech Republic. World airports. Famous aviators. Helicopters. CSA airplanes. Development of aircrafts in Czechoslovakia between the years 1945-1989. Classic era of aviation. Golden era of civil aviation. Modern era of civil aviation. Airline companies. Supersonic flying.			
615Y1NE	German in the Economy and Society	KZ	2
Recent economic and social issues of German speaking countries and of the EU. Reading and listening of texts. Lexical, grammatical and semantic analysis of texts. Discussion on selected topics.			
616UDDM	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.			
616W1PV	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.			
616X31	Project 1	Z	2
616X32	Project 2	Z	2
616X33	Project 3	Z	2
616Y1EN	Energy Requirements of Vehicles	KZ	2
Dynamics and the driving inertial of the vehicles. Types of energy - kinetic, static, heat, chemical and others. Ways of energy change into kinetic energy. Combustion engine, electric drive, steam engine, air engine. Energy accumulation means, accumulator, flywheel, fuel cell. Energy recuperation. WTW analysis.			
616Y1IS	Interactive simulators and simulations	KZ	2
Simulation theory and application of computing equipment. Creating computing models. Mechanical and dynamic systems and their mathematical models. Computing methods. Simulation of vehicle dynamics, on-land carriage in particular. Virtual reality systems. Practical exercise with simulation software and interactive simulators.			

616Y1KS	Quality and Reliability of Vehicles	KZ	2
Quality and reliability theory in design, development, production and operation of vehicles. Definition and possible approach to quality and reliability. Key legislation. FMEA (Failure Mode and Effects Analysis), QFD (Quality Function Deployment), DfX (Design for Assembly, Manufacturing, Quality, Services ...) and other methods used in industrial applications. Knowledge-based systems of quality and reliability, data collection.			
616Y1PV	Operation, Construction and Maintenance of Vehicles	KZ	2
Methods of vehicle production. Vehicle maintenance. Vehicle diagnostics. Maintenance and repair plans. Engine maintenance and emission measurement. Transmission mechanism. General principles of engine diagnostics.			
616Y1RE	Control and Electronic Vehicle Systems	KZ	2
Elementary concepts of regulation. Tools for analytical solution, linear system description. Basic types of a regulator (PID), properties, advantages, disadvantages, function. Conventional and hybrid drive control. Electric drive. Vehicle communication bus (CAN, LIN, FlexRay, ISObus, KWP2000 protocols etc.). Vehicle electronic control, safety, communication and comfort systems.			
616Y1VT	Development in Railroad Vehicles	KZ	2
Railroad vehicles traction. Railroad vehicle parameters regulation. Control and driving of railroad vehicles. Importance in heavy duty and personal transportation. Critical situation assessment. New materials in design. International standardization.			
616Y1ZG	Introduction into Applied Computer Graphics	KZ	2
Computer graphics, division and applications with emphasis on transport, including development and research. Colours, colour perception, colour schemes, models, principles of 2D and 3D generation, elementary algorithms for graphic data workout. Visualisation principles and tasks, techniques, graphics and visualisation HW basics. Introduction to 2D and 3D graphics software.			
616Y1ZL	Vehicle Testing, Legislation and Construction	KZ	2
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.			
617DNV	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.			
617E	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.			
617EDOT	Economy, Transport, Telecommunications	KZ	2
Transport, telecommunications, demand, supply, indicators, economic development, legislation, European union, regulation, liberalisation, transport modes, ITS, sustainability.			
617EDTP	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.			
617EM	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.			
617FIF	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.			
617GEDS	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.			
617HG	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.			
617LOS	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.			
617MEKA	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.			
617MSTP	Small and Medium Enterprise	KZ	2
SME, design, plan, market, analysis, finance, management, decision making, survival, growth.			
617MVD	Marketing in Transportation	Z,ZK	2
General principles of the marketing applied in transportation. Marketing, marketing research, microworld, markets, market positioning, products, brands, package, service, pricing, distribution channels, physical distribution, retail, wholesale, promotion, advertising, segmentation, placement, action plan.			
617PDO	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.			
617RIP	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.			
617TCHR	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.			

617TDL	Transport Technology and Logistics	Z,ZK	3
Basic terms in transport technology and logistics. Particular steps of transport planning. Quantification of carriage relations. Line planning. Timetabling. Planning in passenger and freight transport. Organisation of traffic in each transport means. Technological factors from the point of view of operator and client. Organisation of public city transport. Logistic technologies and their application using various transport means.			
617TGA	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.			
617W1AF	Alternative Forms of Transportation Project Financing	KZ	4
There will be specified such forms of financing in transportation, where the public sector body perform the final debtor, i. e. debtor payments come from its budget, but the final debtor is not a direct participant of the transaction and it is not the counterparty of the financial institute which provides the funding. Issue of securities as an alternative source of transportation project.			
617W1EV	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.			
617W1LL	Logistics of Passenger and Freight Air Transportation	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.			
617W1ND	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.			
617W1OF	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).			
617W1PM	Personnel Management	KZ	4
Human sources, work group, man as personality, planning, choice, evaluation and education of human sources, work adaptation, teamwork, intercultural communication.			
617W1ST	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.			
617X31	Project 1	Z	2
617X32	Project 2	Z	2
617X33	Project 3	Z	2
617Y1AF	Alternative Forms of Transportation Project Financing	KZ	2
There will be specified such forms of financing in transportation, where the public sector body perform the final debtor, i. e. debtor payments come from its budget, but the final debtor is not a direct participant of the transaction and it is not the counterparty of the financial institute which provides the funding. Issue of securities as an alternative source of transportation project.			
617Y1EV	Public Sector Economy	KZ	2
Economic and financial theory of public sector, public choice theory, externalities, decisions about public finance allocation, economic assessment of public projects (CBA, MCA, CEA), tax system of the CR, state budget, management of public projects a their economic efficiency assessment, way of elaboration of PPP projects, funding from EU funds, program HDM-4.			
617Y1LL	Logistics of Passenger and Freight Air Transport	KZ	2
Logistics airline passenger and cargo. Aircraft and airport terminals for passenger and cargo transport. Airlines in terms of logistics systems. Aerial transport process passengers and air cargo. Information systems in air transport. Global distribution systems.			
617Y1ND	Maritime Transportation	KZ	2
History and importance of the maritime transportation, theoretical discipline in maritime transportation, seafaring vessels, maritime ports and their utilization, inland logistic centre and maritime ports, transport corridors and link by maritime, river and rail transport I and II, global maritime corridors, logistics of maritime transportation, maritime transportation and smart containers, ITS in maritime transport.			
617Y1OF	Personal Finance	KZ	2
Personal finance (budget, financing of basic living needs), debt (loans and credits, payment instruments, interest and fees, debt trap), financing of housing (rent, mortgage, savings, consumer loans, refinancing), savings and investments (investment horizon, return, risk, investment strategy), insurance (insurance types, suitability and adequacy), securing the future (retirement savings and insurance).			
617Y1PM	Personnel Management	KZ	2
Human sources, work group, man as personality, planning, choice, evaluation and education of human sources, work adaptation, teamwork, intercultural communication.			
617Y1ST	Titan Simulation	KZ	2
Titan is a management game simulating the business decisions. Lets 2-8 student groups to produce and compete in the market with the same product. Students set a price and determine the quantity and capacity of production, plan budgets for marketing, research and development. They become familiar with the consequences of their decisions by the form of financial corporate reports and they use this information for other business decisions.			
618KIAD	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.			
618MR11	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.			
618MR12	Materials 2	KZ	2
Fundamental concepts, notions. The main materials groups. Semiconductors. Polymers. Special types of steel. Properties and application of the composite materials.			
618PZP	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.			

618ST	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.			
618TTED	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.			
618Y1AM	Anatomy, Mobility and Safety of Man	KZ	2
Survey of tissues. Anatomical structure and growth of bones. Articular joint. Remodelling of bone tissue. Anatomical structure of muscles. Blood circulation and nervous system. Structure and biomechanics of muscular-skeletal system. Injury of human organs and musculo-skeletal system during traffic accidents. Mobility of ill and injured man and his treatment. Human joint prostheses. Protective means and traffic safety regulations.			
618Y1D1	Dynamics of Routes and Vehicles 1	KZ	2
Theory and analysis of vibration of multimass systems. Dynamical model of vehicle and interaction with transport structure. Assessment of structure vibration and allowable criteria. Vibroisolation and absorbers of dynamical effects. Methods of experimental dynamics. FEM in structure dynamics.			
618Y1EM	Experimental Methods in Mechanics	KZ	2
The purpose and role of experimental mechanics. Sensors for mechanical testing. Overview of experimental methods. Destructive and non-destructive testing of materials. Design of experimental procedures and sample preparation. Tensile and bending tests. Electrical resistance strain gages. Optical based strain measurement. Fatigue and lifetime prediction. Instrumented hardness testing. Introduction to electron microscopy. Errors in measurement.			
618Y1MT	Engineering Materials	KZ	2
Systematic overview of main classes of materials used in technical design. In addition to main classes of materials, i. e. metals, ceramics, polymers and composites, attention is paid to biological materials and to biomimetics. Integral approach to material selection process is also demonstrated based on so called Ashby's selection charts.			
618Y1PS	Computer Simulations in Mechanics	KZ	2
Principles and overview of programs for stress analysis of structures. Numerical methods in mechanics, finite element method. Geometric model development and adaptation of geometry from other CAE systems. Assignment of material properties. The types of elements and their use. Discretization of solid model. Boundary conditions and application of the load. Basic tasks of structural and modal analysis. Introduction to complex nonlinear problems.			
618Y1UK	Introduction of Rail Vehicles	KZ	2
Basic characteristics and parameters rail transport systems - railway and urban transport. Basis driving mechanics rail vehicles - equation of motion train and unit trains. Rolling and track resistance. Total running resistance. Acceleration force. Analyzing driving cycle rail vehicle. Speed-power diagrams and characteristics rail vehicle - hydromechanic, hydrodynamic and electric drive. Design concept rail vehicles and drive of wheel set.			
620SSA	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.			
620UIS	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.			
620Y1AE	Applied Electronics	KZ	2
Basic electronic semiconductor components, their principles, characteristics and typical connection diagrams. Semiconductor PN junction diodes, transistors, thyristor, operational amplifiers, basic logic gates. Functions of basic electronic circuits and methods for their designs (rectifiers, voltage regulator with Zener diode, transistor as an amplifier, operational amplifier as an inverting and noninverting amplifier).			
620Y1EA	Environmental Aspects of Transport	KZ	2
State of the atmosphere, weather observation network, weather in transportation, road meteorology. Weather forecasting, data assimilation, probabilistic forecasts, forecast evaluation. Air quality, main pollutants and their effects, atmospheric chemistry, traffic emissions. Greenhouse gasses, carbon cycle, a role of energy and transportation in climate change.			
620Y1EK	Qualification in Electrical Engineering	KZ	2
Practical experience with measurements in laboratories, electrical equipment, power supply, electrical installation of low voltage, electric shock hazard, symbols and labeling, nominal voltage, maximum allowed currents, electrical equipment protection against short circuit and overload protection, control and revision, first aid, legislation, standards and regulations in relation to health and safety and electrical engineering.			
620Y1LN	Location and Navigation	KZ	2
Description and examples of road networks, localization on the network. Routing algorithms, their properties and implementation. Description and examples of datasets for finding transport connections, routing algorithms, their properties and implementation.			
620Y1OI	Fare Collection and Information Systems	KZ	2
Fare collection systems in public transport and their components (on-board units, validators, turnstiles, ...). Information systems and their components for users (timetables, maps, panels ...) and operators (cycles, location or current delay of vehicles, ...). The issue of tariff systems. Other examples of clearance systems (parking).			
620Y1PK	Product Quality Management Processes	KZ	2
General principles of organization management. Management systems and international standards; quality management systems. Quality products, processes, systems. A framework of standards for systems management, management principles. Principles of process management, monitoring and measurement systems management. Uniform framework of standards for systems management. Process management principles. Metrology and testing. Product certification.			
620Y1SC	Sensors and Actuators	KZ	2
Principles of sensors and actuators. Basics of measuring theory and actuating influence. The respective technologies and construction principles. Sensors of mechanical, electro-magnetic, state (temperature, humidity), chemical and particle flow values. Electrical, pneumatic and hydraulic actuators and solid phase elements.			
621W1FN	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.			
621W1LR	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.			
621W1MZ	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.			

621W1OL	<b>Security of Air Transport</b> 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.	KZ	4
621W1RZ	<b>Human Resources Management</b> 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.	KZ	4
621W1TH	<b>Aircraft Technical Handling</b> 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.	KZ	4
621W1UT	<b>Airports Maintenance</b> 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.	KZ	4
621W1ZA	<b>Basics of Aerobatics</b> 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.	KZ	4
621Y1FN	<b>Factors Affecting the Rate of Accidents in Aviation</b> 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.	KZ	2
621Y1LR	<b>Radio Technology in Aviation</b> Electric signals and the wave spectrum. Analog and digital modulations. Noises. Filters. Resonance circuits. Electromagnetic field. Electromagnetic wave propagation. Wave ranges in aviation, radiation and reception of electromagnetic field. Antennas in aviation, receivers and transmitters.	KZ	2
621Y1MZ	<b>Managerial Ethics</b> 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.	KZ	2
621Y1OL	<b>Security of Air Transport</b> 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.	KZ	2
621Y1RZ	<b>Human Resources Management</b> 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.	KZ	2
621Y1TH	<b>Aircraft Technical Handling</b> 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.	KZ	2
621Y1UT	<b>Airports Maintenance</b> 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.	KZ	2
621Y1ZA	<b>Basics of Aerobatics</b> 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.	KZ	2
621ZLD	<b>Introduction to Air Transport</b> Air transport as a component of complex transport system. International status of civil aviation. International organizations in Europe and worldwide. Characteristics of air transport. Commercial air transport. Technical operations of aeroplanes.	KZ	2
622UN	<b>Traffic Accidents Introduction</b>	Z	2
622X31	Project 1	Z	2
622X32	Project 2	Z	2
622X33	Project 3	Z	2
622Y1SZ	<b>Forensic Expertise</b> Historical evolution of forensic engineering, forensic activity, current legislature in the Czech Republic, different disciplines, notion of forensic, forensic legislation, basic forensic acts, expert role in the obtaining proofs, forensic methodology. Notion of the evidence, general principles of evidence obtaining, metrology, protocol, evidences collection, site inspection, forensic report, elements. Finding, expert testimony / report.	KZ	2
623KM	<b>Crisis Management</b> Extraordinary events in transport. Crisis states. Authorities of crisis management of the state. Crisis and emergency planning. Precautions of economic mobilization of the state. Use of state material reserves. Organization conditions for crisis states treatment. Technical means for elimination of results of extraordinary events. Protection and renewal of transport infrastructure, ensuring of operation. Information systems of crisis management.	KZ	2
623Y1DZ	<b>Data and Their Processing for Engineering Fields Needs</b> Courses of risk, basic terms, data collection, data sets, data random uncertainty and data epistemic uncertainty, data processing, hazard, risk, value scales, analytical, empirical and heuristic methods, hazard determination and risk determination, methods for variants' creation, decision support systems.	KZ	2
623Y1KO	<b>Quantum Physics and Optoelectronics</b> Ground of quantum physics. Application of quantum physics in practice. Optoelectronics. Production of optoelectronics components.	KZ	2
623Y1OK	<b>Protection of Critical Objects and Infrastructures</b> Types of technological systems, critical item, risks and their courses, criticality, vulnerability, connectivity, dependability, resilience, failure, protection, safety of critical objects and critical infrastructures.	KZ	2
623Y1VS	<b>Negotiation and Cooperation</b> Code of conduct for negotiation. The influence of personality traits on the negotiations. Negotiation and commanding. Teamwork. Variants teams. Informal and formal role in the team. Principles of negotiation, the essence of negotiation, the differences in negotiation in business and in crisis situations, the principle of "win both", specifications and bidding, the role of trust.	KZ	2
TV-1	<b>Physical Education</b>	Z	1

TV-2	Physical Education	Z	1
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For updated information see <http://bilakniha.cvut.cz/en/FF.html>

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